

## **Historic, archived document**

Do not assume content reflects current scientific knowledge, policies, or practices.









2 C

5.7

LIBRARY  
OF THE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE

*Class* 389.2

*Book* C 76

8-1577

Y. 2

a c

5.7



# UNCLE SAM'S ADVICE TO HOUSEWIVES

*COMPILED FROM*  
*GOVERNMENT BULLETINS*  
IN TWO VOLUMES

BY  
VERA L. CONNOLLY

VOL. II

USA  
LIB

NEW YORK  
THE CHRISTIAN HERALD  
BIBLE HOUSE

Copyright, 1917  
BY  
THE CHRISTIAN HERALD

ALL  
RIGHTS  
RESERVED

JAN -2 1918

©CL.A479784

no 2



U. S. DEPARTMENT OF AGRICULTURE AND  
STATE AGRICULTURE COLLEGES COOPERATING

STATES RELATIONS SERVICE, OFFICE OF EXTENSION  
WORK, NORTH AND WEST, WASHINGTON, D. C.

*BOYS' AND GIRLS' CLUB WORK*

---

**PRESERVING EGGS FOR HOME USE**

By

**JOSEPH W. KINGHORNE**

Junior Animal Husbandman in Poultry Investigations, Bureau of  
Animal Industry, U. S. Department of Agriculture

**Why Preserve**

During the spring and early summer, when eggs are abundant and reasonable in price, attention should be given to preserving them for winter use. Fresh eggs properly preserved may be kept for 8 to 12 months, in excellent condition, and used with good results.

**A Good Method and Cost**

A good method for the preservation of eggs is by the use of sodium silicate, or, as it is commonly called, water glass. The present price of sodium silicate is about 30 cents per quart, and at this price eggs may be preserved at a cost of approximately 2 cents per dozen. It is not desirable to use the water glass solution a second time.

FEB 14 1919

h. of C. Tr. 23 Jan. 18

### Time to Preserve

Eggs laid in April, May, and early June have been found to keep better than those laid later in the season. It is recommended, therefore, that ordinarily only eggs laid at this season be preserved.

### Kind of Eggs to Preserve

Very careful attention should be given to the condition of eggs preserved. If satisfactory results are to be obtained, the eggs should be *fresh* and *clean*. Eggs that float, when placed in the solution, are not fresh and therefore cannot be preserved. When only slightly soiled, a cloth dampened with vinegar can be used to remove such stains. Under no circumstances should badly soiled eggs be used for preserving; if put into the jar while dirty, they will spoil; washing in water would remove a necessary coating.

### How to Preserve

#### Water-glass Method

Use 1 quart of sodium silicate to 9 quarts of water that has been boiled and cooled. Place the mixture in a 5-gallon crock or jar. This will be sufficient to preserve 15 dozen eggs; and will serve as a guide for the quantity needed to preserve larger amounts of eggs.

First, select a 5-gallon crock and clean it thoroughly, after which it should be scalded and allowed to dry.

Second, heat a quantity of water to the boiling point and allow it to cool.

Third, when cool, measure out 9 quarts of water, place it in the crock, and add 1 quart of sodium silicate, stirring the mixture thoroughly.

Fourth, the eggs should be placed in the solution. Be very careful to have at least 2 inches of the solution cover the eggs.

Fifth, place the crock containing the preserved eggs in a cool, dry place, well covered to prevent evaporation. Waxed paper, drawn over and tied around the top of the crock, will answer this purpose.

#### Lime Method

When water glass cannot be obtained, the following method may be used in its stead. Many consider this method entirely satisfactory, though instances are known where eggs so preserved have tasted slightly of lime.

Dissolve 2 or 3 pounds of unslacked lime in 5 gallons of water that has previously been boiled and allowed to cool, and allow the mixture to stand until the lime settles and the liquid is clear. Place *clean, fresh* eggs in a clean earthenware jug or keg, and pour the clear lime water into the vessel until the eggs are covered. At least 2 inches of the solution should cover the top layer of eggs.

Sometimes a pound of salt is used with the lime, but experience has shown that in general the lime without the salt is more satisfactory.

#### Using Preserved Eggs

Fresh, clean eggs, properly preserved by either of these methods, can be used satisfactorily for all purposes, in cooking and for the table. When boiling preserved eggs, a small hole should be made in each shell, with a pin, at the large end, before placing them in the water. This is done to allow the air in the egg to escape when heated, so as to prevent cracking.

# U. S. DEPARTMENT OF AGRICULTURE FARMERS' BULLETIN NO. 256

---

## PREPARATION OF VEGETABLES FOR THE TABLE

*Prepared under the Supervision of the Office of Experiment Stations*

A. C. TRUE, Director

---

## INTRODUCTION

The object of this bulletin is to help the housekeeper to a better understanding of the vegetable foods and the methods of preparing them. The aim has been to give, in a simple, clear form, an idea of the structure and composition of plants, with relation to their food value, and the principles underlying the preparation of vegetables for the table. Although the bulletin is not designed primarily as a cookery book, yet a large number of recipes for cooking vegetables are given. These recipes are types, which may be modified or changed to suit the materials or conditions with which the housekeeper has to deal. Every recipe has been carefully tested, and it is only fair to the writer and to the cook that they shall be followed accurately the first time they are used.

Some of the vegetables and herbs called for are not



commonly found in the home garden, but they may be grown in every garden,<sup>1</sup> and are well worthy of a place in our menu.

### Structure and Composition of Vegetables

Plants are made up of innumerable cells, each consisting of a thin membranous wall inclosing a semi-fluid mass, in which lies the nucleus or center of cell activity and minute grains of starch or other material which the plant has elaborated.

The whole framework of the very young plant is made up of these cell walls, commonly called cellular tissue or cellulose. However, early in the growth of the plant, wood cells begin to develop. The wood cells grow into a fibrous substance that may be torn apart like threads, which is called woody fiber. It is this woody fiber, and the thickening and hardening of the cellular tissue, that make poorly grown or stale vegetables hard and indigestible.

Practically all green plants contain a large percentage of water, with a larger or smaller percentage of starch and some nitrogenous material (protein), sugar, gum, crude fiber, and other carbohydrate and mineral matter. The fruits and seeds of some plants are rich in fat, but the plant itself rarely contains any appreciable amount of this constituent.<sup>2</sup>

Chlorophyll, a green coloring matter found in all green plants, is essential for their continued growth and development, as are also light and air. If green plants are covered so that light can not reach them, changes take place in the cells, and the chlorophyll is bleached

<sup>1</sup> See U. S. Dept. Agr., Farmers' Bul. 255.

<sup>2</sup> The composition of a large number of vegetables is given in U. S. Dept. Agr., Office of Experiment Stations Bul. 28, and in Farmers' Bul. 142.

out. Plant cells, when they make their normal growth, frequently elaborate chemical bodies with strong flavor, for instance, the bitter principle found in dandelions. When the chlorophyll bleaches out, it is commonly believed, any strong-flavored bodies also diminish, and this is one reason for covering salad plants from the light in order that they may become blanched. Plants may continue to grow from stored material for a time if light is excluded, but the growth is not the same. The leaves are usually smaller and the stems longer than is the case with normal plants. The cells are larger, have thinner walls, and do not develop chlorophyll, while the percentage of water is higher. In other words, the growth made without light is more tender than the normal growth. This is another reason why such salad plants as endive and celery are blanched before they are used. In some cases the light is excluded by tying up the plants, and in others by covering them.

In the household the term blanching has other meanings. Thus, nuts, like almonds, are blanched when the brown outer skin is removed by treatment with hot water, and vegetables are blanched in cooking, as described later.

Most vegetables contain small amounts of volatile essential oils or other bodies of pronounced flavor, and owe their characteristic taste to such constituents. Sugars and acids when present, as they often are, and mineral salts, found in all vegetable foods, also contribute their share toward the flavor.

### Classification of Vegetables

Vegetable foods may be divided into a few general classes. These are cereals, legumes, tubers, roots and



bulbs, herbaceous or green vegetables, and vegetable fruits and flowers. The cereals are the most valuable of the vegetable foods, including as they do the grains from which is made nearly all the bread of the world. The use of cereals for bread making, for breakfast foods, and in similar ways is taken up elsewhere.<sup>1</sup> In this bulletin, rice and corn are the only cereals considered, as they are the only grains commonly employed as table vegetables.

Rice is largely composed of starch and has very small proportions of nitrogenous, fatty, and mineral matter. Therefore, when used as a vegetable, it is naturally and very properly served with foods rich in the constituents which it lacks. The starch granules in rice are small and angular, and rice is generally conceded to be easily digested. Corn, when ripe, also has a high percentage of starch in addition to a fair proportion of the other nutrients. The dried grains contain about 12 per cent of nitrogenous matter and about 9 per cent of fatty matter. It will be seen, therefore, that it is more nutritious than rice. Like all starchy foods, corn may be served or combined with foods rich in nitrogenous and fatty matter, to form a well-balanced diet. Green corn is a succulent vegetable containing a fair proportion of carbohydrates in addition to a small proportion of the other nutrients.

Legumes belong to the pulse family. The fruit is usually in the shape of a pod. Although there are several thousand species of the Leguminosæ or pulse, only a few kinds are used as table vegetables,—beans, peas, cowpeas, and lentils being the legumes principally employed as human food. The dried seeds of beans, peas, and lentils constitute a most valuable all-the-

<sup>1</sup> U. S. Dept. Agr., Farmers' Buls. 105, 112, 193, 237, 249.

year-round food supply. The seeds occupy small space, keep well, and may be prepared in a great many appetizing and nutritious forms.

The ripe leguminous seeds are very rich in nitrogenous matter. Peas, beans, cowpeas, and lentils contain on an average 25 per cent nitrogenous matter and over 50 per cent starch, and about 10 per cent cellulose, fatty matter, and mineral matter. When properly cooked and consumed in reasonable quantities, peas, beans, and lentils may replace a portion of the meat in the daily dietary. The unripe legumes and their edible pods, like all green vegetables, are quite succulent foods, the proportion of nutritive material being small as compared with the water present.

Since the fatty matter in the legumes enumerated does not average 3 per cent, they are commonly and wisely cooked with some added fat. The green seeds and the green pods of peas and beans are not so highly nutritious as the dried seed, but they are more delicate and apparently more easily digested.<sup>1</sup>

Among the foods served as table vegetables, tubers and roots have an important place. The potato comes next to the cereals in its almost universal employment and the material consumed. We have no other vegetable that lends itself to such a variety of preparations. The potato contains a large percentage of water, a fair percentage of starch, a very small percentage of sugar, and nitrogenous, fatty, and gummy matter, and about 1 per cent of mineral matter. The mineral matter consists of potash and soda salts, citrates, phosphates, magnesia, and silicate of lime.

<sup>1</sup> For a fuller description of these vegetables see U. S. Dept. Agr., *Farmers' Buls.* 121 and 169.

It is to this mineral matter that the potato owes its antiscorbutic properties.

The sweet potato is rich in starch and sugar. The percentage of nitrogenous and fatty matter is very small. This vegetable makes a pleasant and healthful addition to the table. It is somewhat laxative.

The Jerusalem artichoke,<sup>1</sup> a fairly common tuber used as a vegetable, is a species of sunflower. The name is a corruption of *girasole*, the Italian name for sunflower. The Jerusalem artichoke tubers can be left in the ground during the winter; they are welcome and refreshing in the spring when fresh vegetables are scarce. The carbohydrates, which constitute 14 or 15 per cent of the tuber and are the principal nutritive material present, consist largely of inulin instead of the starch which is so characteristic in most other tubers.

The true roots most used as table vegetables are beets, radish, turnips, parsnips, carrots, salsify, and celeriac. Both the parsnip and salsify withstand frost and may be left in the ground all winter, thus making it possible to have these vegetables in the early spring as well as in the fall. However, they must not be left in the ground too late in the season the following spring, as they soon grow hard and fibrous. Turnips, beets, and carrots, for summer and fall use, should be of the quick-growing kind, and should not be allowed to grow to great size. To have these vegetables in perfection it is necessary to sow them frequently during the season. When growing for winter use, these roots, like all vegetables that are to be stored, must, of course, develop until mature, else they will not keep well.

<sup>1</sup> For data regarding the culture and food value of the Jerusalem artichoke see U. S. Dept. Agr., Farmers' Bul. 73, p. 10.



The bulb-bearing plants belong to the lily family, the onion being the bulb most generally used as a vegetable and flavorer. On the Continent of Europe very many other members of the onion family are also freely used as flavorers, and no continental kitchen garden would be considered complete without several varieties, such as the common onion, leek, shallot, garlic, chives, and cibol. Much of the delicious flavor of the French and Italian cookery is due to the skillful combination of several of the onion flavors.

The herbaceous vegetables, cabbage, lettuce, celery, spinach, etc., are valuable for their refreshing qualities, the salts they yield, and the variety they give to our diet, but owing to the amount of water they contain (90 per cent or more on an average), their food value is low. The leaves, stems, and shoots are the parts used as food. These vegetables should be employed while young and tender; the more rapidly the vegetables grow, the more tender they will be. Slow growth favors the development of tough and woody matter, as is very noticeable in asparagus, lettuce, etc., in cold springs and summers. The list of herbaceous vegetables is long and includes the cabbage tribe, celery, asparagus, and all the green leaves, stalks, and shoots that are employed, cooked, or used as salads.

Fruits used as vegetables include tomatoes, okra, squash, pumpkin, cucumber, eggplant, and peppers, among others. Such fruits as muskmelon and watermelon are used as fruits<sup>1</sup> rather than as vegetables, and are not taken up here. In the case of globe or French artichoke, cauliflower, and broccoli the flower buds or inflorescence are the parts eaten.

<sup>1</sup> Fruit and Its Uses as Food, U. S. Dept. Agr. Yearbook 1905, p. 307.

## General Principles Underlying Vegetable Cooking

Vegetables are baked, roasted, fried, or boiled, are used for making a great variety of dishes, and are prepared for the table in other ways; but the most common method of cooking them is in boiling water. Steaming is not infrequently resorted to as a method of cooking vegetables and is, of course, similar in principle to boiling in water.

The simpler the methods of cooking and serving vegetables, the better. A properly grown and well-cooked vegetable will be palatable and readily digested. Badly cooked, water-soaked vegetables very generally cause digestive disturbances, which are often serious. Nearly every vegetable may be cooked so that with plain bread it may form a palatable course by itself, if it is desired to serve it in this manner.

All green vegetables, roots, and tubers should be crisp and firm when put on to cook. If for any reason a vegetable has lost its firmness and crispness, it should be soaked in very cold water until it becomes plump and crisp. With new vegetables this will be only a matter of minutes, while old roots and tubers often require many hours. All vegetables should be thoroughly cleaned just before being put on to cook. Vegetables that form in heads, such as cabbage, cauliflower, and Brussels sprouts, should be soaked, heads down, in salted cold water, to which a few spoonfuls of vinegar may be added. If there are any worms or other forms of animal life in these vegetables, they will crawl out. To secure the best results all vegetables except the dried legumes must be put in boiling water, and the water must be made to boil again as soon as possible after the vegetables have been

added, and must be kept boiling until the cooking is finished. Herbaceous vegetables should boil rapidly all the time. With tubers, roots, cauliflower, etc., the ebullition should not be so violent as to break the vegetables. Green beans and peas when removed from the pod must also be cooked gently, i.e., just simmer. When the pods and all are used, they are to be cooked rapidly, like the herbaceous vegetables.

To secure the most appetizing and palatable dishes, only fresh tender vegetables should be cooked. If, however, green beans, peas, etc., have grown until a little too old and it still seems best to gather them, a very small piece of baking soda added to the water in which they are boiled makes them more tender, it is commonly believed, and helps to retain the color. Too much soda injures the flavor, and an excess must be carefully avoided. A little soda may also be used to advantage if the water is quite hard. Peas may be boiled for 15 or 20 minutes in the water to which the soda has been added, then be cooked the same as peas with pork.

During the cooking of all vegetables, the cover must be drawn to one side of the stewpan to allow the volatile bodies liberated by the heat to pass off in the steam. All vegetables should be thoroughly cooked, but the cooking should stop while the vegetable is still firm. This, of course, does not apply to vegetables that are cooked in soups, purées (thick strained soups), etc. The best seasoning for most vegetables is salt and good butter. Vegetables that are blanched, and then cooked with butter and other seasonings and very little moisture, are more savory and nutritious than when all the cooking is done in a good deal of clear water.



### **Blanching Vegetables as a Cooking Process**

Blanching, which in cookery is entirely different from the bleaching or blanching of green vegetables in the garden, is a cooking process often used with vegetables, since it removes the strong or acrid taste and improves the quality. It is also convenient, since blanching may be done at any time, and the cooking completed in a very short time when the dish is to be served.

Have a large stewpan half full of rapidly boiling water. Add a tablespoonful of salt for every 2 quarts of water. Have the vegetables cleaned and well drained. Drop them into the boiling water, and bring the water back to the boiling point as quickly as possible. Boil rapidly, with the cover partially or wholly off the stewpan, 5 to 20 minutes, depending upon the vegetable, then drain off the water. If the cooking of the vegetable is not to be finished at once, pour cold water over the vegetable to cool it quickly, then drain and set aside until needed. If the cooking is to be continued at once, it will not be necessary to rinse the vegetable with cold water. To complete the cooking, the vegetable should be put in a small stewpan with butter or drippings and the other seasonings and cooked gently until done. A few spoonfuls of liquid will be required for every quart of very juicy vegetables, and half a pint of liquid for drier vegetables. The stewpan should be covered, only a slight opening being left for ventilation. All vegetables cooked in this manner should be cut up rather small either before or after the blanching.

### **Waste in Preparing Vegetables**

In preparing vegetables for the table there is almost always a larger or smaller loss due to inedible matter,

skins, roots, seeds, etc., and also a waste of good material, which is caused by careless paring, etc., all these losses being grouped together in reporting analyses under the name "refuse." The amount of refuse varies greatly in different vegetables, as shown by a large number of analyses of American food materials.<sup>1</sup> The amount may be very small (7 per cent) in such vegetables as string beans; medium (10 per cent to 15 per cent) in such vegetables as onions, cabbage, leeks, lettuce, cucumbers; or high (50 per cent) in such vegetables as beans in pod, pumpkins, and squash. With tubers, such as potatoes, the average amount of refuse is 20 per cent, and with such roots as turnips 30 per cent.

In preparing vegetables for the table, the careful cook will remove all inedible portions and will see to it that the total amount of refuse is as small as is consistent with good quality. Thin paring of potatoes and other vegetables is an economy which it is worth while to practice, and is an easy way of decreasing useless loss.

### Losses in Cooking Vegetables

In baking vegetables there is little loss of material, except for the water which is driven off by the heat. When vegetables are immersed in water, as in boiling, a greater or less loss of material is almost inevitable, the kind and amount of material extracted by the water depending upon such factors as the sort of water used, its temperature at the beginning and during the cooking period, the length of time the cooking is continued, and the condition of the vegetable, that is, whether pared, whole, or cut into small pieces.

<sup>1</sup> U. S. Dept. Agr., Office of Experiment Stations Bul. 28.

In experiments carried on under the auspices of the Office of Experiment Stations,<sup>1</sup> it was found that when potatoes were boiled in the jackets the loss of material was very trifling. When peeled and soaked for several hours before boiling, the loss in round numbers amounted to about 50 per cent of the nitrogenous material, and 40 per cent of the mineral matter present. When potatoes were peeled and placed at once in boiling water, only about 8 per cent of the proteid matter and 19 per cent of the mineral matter present were extracted by the water. Little starch was removed from the potatoes by the solvent action of water, but when peeled potatoes were boiled the amount of starch removed by abrasion was considerable, at times nearly 30 per cent of the total value of the potato.

In the experiments with carrots it was found that the loss was greatest when the roots were cut into small pieces, amounting in this case to nearly 30 per cent of the total food material present. The sugar extracted when the carrots were boiled was equivalent to nearly a pound to the bushel. When cabbage was boiled, the amount of material extracted was found to be considerable, amounting to about one-third of the total food material present, the chief constituents extracted by the water being ash or mineral matter. Some recent German experiments<sup>2</sup> have shown that when vegetables are steamed, only one-third as much material is removed as when they are boiled.

In all cases the loss in cooking vegetables is not great enough to influence seriously the method of cooking selected in the ordinary family. But in institutions

<sup>1</sup> U. S. Dept. Agr., Office of Experiment Stations Bul. 43; Farmers' Bul. 73, p. 22.

<sup>2</sup> Landw. Jahrb. Schweiz, 19 (1905), p. 619.



where, owing to small funds, every effort must be made to obtain the most nutritious diet from the available food supply, it is only fair to say that of two equally palatable methods of cooking vegetables that should be selected which entails the smallest loss.

### **Changes that Take Place in Cooking Vegetables**

Briefly, these are the principal changes that take place in vegetables during cooking: The cellular tissue is softened and loosened; the nitrogenous substances are coagulated; the starch granules absorb moisture, swell, and burst; and flavors and odors are developed.

As long as the vegetable is kept at a temperature above 125° F., changes continue to go on in the vegetable substance. The most marked of these are in the starch and in the odor, color, and flavor of the vegetable. Starch will not dissolve in cold water, but pure starch gelatinizes readily in hot water, and if the temperature is high enough will become gummy and opaque. If starch is cooked in just moisture enough to swell and burst its granules and is then kept hot, but without additional moisture, a change will continue to take place, though the starch will remain dry and glistening. The flavor grows sweeter and more nutty the longer the starchy food cooks in dry heat. (See Boiled potatoes, Boiled rice.) It is only vegetables that are composed largely of starch that can be kept hot in this manner without acquiring a strong taste and poor color. Potatoes, if kept in a closely covered vessel or with the unbroken skins on, will become soggy and dark and have a rank flavor. This is owing to the retention of moisture, which changes some of the starch to a sticky gummy mass, and very prob-

ably to the noxious volatile bodies which are generated by heat and should be allowed to pass away. If the skins are broken and the vessel ventilated, potatoes may be kept warm a long time without spoiling.

During the cooking of all kinds of foods, gases are developed which, if retained in the food, give it a strong flavor and odor, and which, there is reason to believe, are injurious. What all these gases are and just how they act is not yet known, because very little research has been made along these lines. It has been found, however, that, in addition to water vapor, carbon dioxid is of common occurrence, as is also hydrogen sulphid, mercaptan (sulphur alcohol), or some other volatile sulphur compound.

The carbonic-acid gas is liberated from practically all foods, and sulphureted hydrogen or other volatile sulphur compound from practically all except the starchy vegetables. If the food be thoroughly ventilated while cooking, the gases will pass off in the steam. Many experiments which the writer has made have shown that foods which are well ventilated during cooking are better flavored than those which are closely covered. Experiments have also convinced the writer that thoroughly ventilated foods are more wholesome than those that are not. Hence the urgent necessity for thorough ventilation while cooking vegetables or any other foods.

Overcooking changes and toughens the texture of vegetable foods, destroys the chlorophyll and other coloring matters, and volatilizes or injures the bodies which contribute to the flavor. Overcooked vegetables are inferior in appearance and flavor and often indigestible (that is, promotive of digestive disturbance) as well as unpalatable.

### Cabbage

Because of the relatively large amount of sulphur which cabbage contains, it is apt to be indigestible and cause flatulence when it is improperly cooked. On the other hand, it can be cooked so that it will be delicate and digestible. It is one of our most useful vegetables, being available during the late fall, winter, and spring months, when other green vegetables are difficult to procure. The quickest and simplest methods of cooking cabbage are the best. The essentials for the proper cooking of this vegetable are plenty of boiling water, a hot fire to keep the water boiling all the time, and thorough ventilation, that the strong-smelling gases, liberated by the high temperature, may be carried off in the steam.

Young cabbage will cook in 25 or 30 minutes; late in the winter it may require 45 minutes. The vegetable when done should be crisp and tender, any green portion should retain the color, and the white portion should be white and not yellow or brown. Overcooked cabbage or cauliflower is more or less yellow, has a strong flavor, and is very inferior to the same dish properly cooked. In addition, overcooking is a cause of digestive disturbance.

### TO BOIL CABBAGE

Cut a small head of cabbage into four parts, cutting down through the stock. Soak for half an hour in a pan of cold water to which has been added a tablespoonful of salt; this is to draw out any insects that may be hidden in the leaves. Take from the water and cut into slices. Have a large stewpan half full of boiling water; put in the cabbage, pushing it under the water with a spoon. Add one tablespoonful of salt, and cook from twenty-five to forty-five minutes, depending upon the age



of the cabbage. Turn into a colander, and drain for about two minutes. Put in a chopping bowl, and mince. Season with butter, pepper, and more salt if it requires it. Allow a tablespoonful of butter to a generous pint of the cooked vegetable. Cabbage cooked in this manner will be of delicate flavor and may be generally eaten without distress. Have the kitchen windows open at the top while the cabbage is boiling, and there will be little if any odor of cabbage in the house.

### CABBAGE COOKED WITH PORK

For a small head of cabbage, use about half a pound of mixed salt pork. Boil the pork gently for three or four hours. Prepare the cabbage as for plain boiled cabbage. Drain well and put on to boil with the pork. Boil rapidly for twenty-five to forty-five minutes. Serve the pork with the cabbage. The vegetable may require a little more salt.

Smoked bacon or ham may be substituted for the pork. Cabbage may be cooked in water in which corned beef was boiled.

### CREAMED CABBAGE

1 pint boiled and minced cabbage.	1 teaspoonful flour.
$\frac{1}{2}$ pint hot milk.	$\frac{1}{2}$ teaspoonful salt.
1 tablespoonful butter.	$\frac{1}{2}$ teaspoonful pepper.

Put the cabbage, hot milk, salt, and pepper in a stewpan and on the fire. Beat the butter and flour together until creamy, then stir into the contents of the stewpan. Simmer ten minutes, being careful not to scorch the sauce; serve very hot.

### CABBAGE WITH SAUSAGE

6 sausages.	$\frac{1}{2}$ teaspoonful pepper.
1 quart minced cabbage.	Salt if necessary.

Fry the sausages crisp and brown. Take from the frying pan, and pour off all but three tablespoonfuls of the fat. Put the minced cabbage in the frying pan and cook six minutes. Arrange in a hot dish and garnish with the sausages. Serve mashed potatoes with the dish.

## PURÉE OF CABBAGE AND POTATOES

- |   |                                   |
|---|-----------------------------------|
| 1 pint boiled finely-minced<br>cabbage.         | 2 teaspoonfuls salt.              |
| 6 medium-sized potatoes.                        | $\frac{1}{2}$ teaspoonful pepper. |
| 2 tablespoonfuls butter or<br>savory drippings. | $\frac{1}{2}$ pint hot milk.      |

Peel the potatoes and put them in a stewpan with boiling water enough to cover them. Cook just thirty minutes. Pour off the water and mash fine and light. Beat in the hot milk, seasoning, and cabbage. Cook about five minutes longer.

## Cauliflower

This vegetable, which a few years ago was a luxury, is now cultivated by nearly all market gardeners, and is within the means of all housekeepers. It is a most delicious vegetable, when properly cooked, and vile when improperly cooked, which generally means when overcooked.

Remove all the large green leaves and the greater part of the stalk. Put the head down in a pan of cold water which contains to each quart a teaspoonful of salt and a teaspoonful of vinegar. Let it soak in this water an hour or more. This is to draw out worms, if any should be hidden in the vegetable. When ready to cook the cauliflower, put it into a large stewpan, stem end down, and cover generously with boiling water. Add a tablespoonful of salt and cook with the cover of the saucepan partially off, boiling gently all the time. A large compact head will require a full half hour, small heads from 20 to 25 minutes. If the flowers are loose, the heat penetrates to all parts quickly. When compact, a little extra time should be allowed for the cooking, but the time must never exceed the half hour. The cauliflower begins to deteriorate the moment it begins to be overcooked. Overcooking, which is very common, can be told by the strong flavor and dark color. It makes the vegetable not only unpleasant to the eye and **palate**, but indigestible also. If this vegetable must be kept **warm** for any length of time, cover the dish with a piece of cheese-cloth. In hotels and restau-

rants it is better to blanch it, chill with cold water, and then heat in salted boiling water when needed.

### CREAMED CAULIFLOWER

1 pint cooked cauliflower.	1 tablespoonful butter.
1 pint milk.	$\frac{1}{2}$ tablespoonful flour.
1 teaspoonful salt.	3 slices toasted bread.
$\frac{1}{2}$ teaspoonful pepper.	

Have the cooked cauliflower broken into branches and seasoned with half the salt and pepper. Put the butter in a saucepan and on the fire. When hot, add the flour, and stir until smooth and frothy, then gradually add the milk, stirring all the time. When the sauce boils add the salt, pepper, and the cauliflower. Cook 10 minutes and dish on the slices of toast. Serve very hot.

### Broccoli

This vegetable is a species of cauliflower and can be cooked and served in the same manner.

### Brussels Sprouts

\* This is a species of cabbage, which forms in many small heads, about the size of an English walnut, on the stock of the plant. It is fairly common in most large markets and is worthy of more extended use than it has commonly met with in the United States.

### BRUSSELS SPROUTS BLANCHED

\* Remove the wilted or yellow leaves from the little heads or "sprouts," cut the stock close to the head, and soak in salted cold water for an hour or more. Drain well and put into plenty of boiling salted water. Allow one teaspoonful of salt to 2 quarts of water. Boil rapidly for 15 or 20 minutes, the time depending on the size of the heads. When done turn into a colander and pour cold water over the heads. They are now ready to cook in butter, or to serve with any kind of sauce. Or the boiling water may be drained from the sprouts, which can then be seasoned with butter, salt, and pepper.



## BRUSSELS SPROUTS SAUTÉ

1 quart Brussels sprouts.                       $\frac{1}{2}$  teaspoonful salt.  
3 tablespoonfuls butter.                       $\frac{1}{2}$  teaspoonful pepper.

To sauter a food is to cook it quickly in a frying pan in a little fat. Blanch the sprouts and drain well. Put them into a broad-bottomed saucepan with the butter and other seasonings. Place over a hot fire and shake frequently. Cook 5 minutes. Serve hot.

## Kale, or Borecole

There are several varieties of this vegetable. The dwarf, green-curled kale is the best for the table and is a fall and spring vegetable. The leaves are sweeter and more tender after having been touched by the frost. In the North the roots may be banked with earth at the beginning of winter, and when extreme cold weather sets in the plants may be covered lightly with hay or straw. In the spring the old stalks will produce young shoots that make delicious greens.

## KALE BOILED WITH PORK

Cook the kale the same as cabbage with pork.

## MINCED KALE

Remove all the old or tough leaves. Wash the kale thoroughly and drain, then put on to cook in a kettle of boiling water, to which has been added salt in the proportion of 1 tablespoonful to 4 quarts of water. Boil rapidly, with the cover off the kettle, until the vegetable is tender. Pour off the water, and chop the kale rather fine; then put back into the kettle and add 1 tablespoonful of butter and 2 of meat broth or water for each pint of the minced vegetable. Add more salt if required. Cook for 10 minutes and serve at once. The time required for cooking kale varies from 30 to 50 minutes. If young and fresh from the garden it will cook in 30 minutes.



### Sea Kale

This is a delicious spring vegetable. It requires practically the same culture as asparagus, and the young shoots are cooked in the same way as this vegetable. Sea kale may be cut the third year from the planting of the seed. Cutting should not be continued after the flower heads begin to form. The flower heads may be cooked the same as broccoli.

### Spinach

This vegetable is a great resource in cold weather when green vegetables are scarce.

The common spinach, which is the sort usually met with in gardens or markets, goes to seed quickly in hot weather, but New Zealand spinach, which is a very different plant from ordinary spinach and far less well known in the United States, yields tender greens all summer. The shoots should be cut regularly; if not, the old shoots become tough and rank flavored.

Spinach has little food value, but its refreshing and slightly laxative qualities make it a valuable adjunct to the more substantial foods. It contains little starch and only a suggestion of sugar, and is therefore one of the vegetables that physicians include in the bill of fare of many invalids who require a diet without these carbohydrates.

Like most other vegetables, it is rarely cooked to perfection, yet it is not difficult to prepare. Except for special reasons the simplest methods are the best for this vegetable. No matter how cheap the raw spinach may be, it is always expensive in two things—labor and butter. It takes a good deal of time, water and patience to wash it clean, and no other vegetable requires so much butter if it is to be at its best. Where strict economy must be practiced, sweet drippings from roast beef or chicken can be substituted for the butter.

To clean the spinach, cut off the roots, break the leaves apart and drop them into a large pan of water, rinse them well in this water and put them in a second pan of water. Continue washing in clean waters until there is not a trace of sand on the bottom of the pan in which the vegetable was washed. If the spinach is at all wilted let it stand in cold water until it becomes fresh and crisp. Drain from this water and blanch. For half a peck of spinach have in a large saucepan 3 quarts of boiling water and 1 tablespoonful of salt. Put the drained spinach in the boiling water and let it boil 10 minutes, counting from the time it begins to boil. When it begins to boil, draw the cover of the saucepan a little to one side to allow the steam to escape. At the end of 10 minutes pour the spinach into a colander, and when the hot water has passed off pour cold water over it. Let it drain well and mince coarse or fine, as is suitable for the manner in which it is to be served.

One peck of spinach will make about  $1\frac{1}{2}$  pints when blanched and minced.

### SPINACH WITH CREAM

$\frac{1}{2}$ peck spinach.	1 teaspoonful salt.
2 tablespoonfuls butter.	$\frac{1}{2}$ teaspoonful pepper.
1 tablespoonful flour.	$\frac{1}{2}$ pint cream or milk.

Blanch and mince the spinach. Put the butter in a saucepan and on the fire. When hot add the flour and stir until smooth and frothy, then add the minced spinach and the salt and pepper. Cook for 5 minutes, then add the milk or cream, hot, and cook 3 minutes longer. Serve.

### SPINACH WITH EGG

$\frac{1}{2}$ peck spinach.	2 eggs.
3 tablespoonfuls butter.	3 teaspoonfuls salt.
$\frac{1}{2}$ teaspoonful pepper.	

Wash and blanch the spinach, using 2 teaspoonfuls of the salt in the water in which the vegetable is boiled. Drain the blanched spinach and chop rather fine, return it to the saucepan and add the salt, pepper, and butter. Place on the fire and cook 10 minutes. Heap in a mound on a hot dish and garnish with the hard-boiled eggs, cut in slices.

### SPINACH COOKED WITHOUT WATER

Fresh spinach when washed holds enough water for cooking. Put the spinach in a stewpan and on the fire; cover and cook for 10 minutes. Press down and turn the spinach over several times during the cooking. At the end of 10 minutes turn the spinach into a chopping bowl, and mince rather fine. Return to the stewpan and add the seasonings, allowing for half a peck of spinach two generous tablespoonfuls of butter and a teaspoonful of salt. Simmer 10 minutes; or if very tender 5 minutes will be sufficient.

Spinach cooked in this manner will retain all its salts. It will be more laxative and the flavor stronger than when blanched (boiled in water). In young, tender spinach this is not objectionable, but when the overgrown vegetable is cooked in its own moisture the flavor is strong and somewhat acrid.

### Lettuce

If lettuce has grown until rather too old for salad, it may be cooked, and makes a fairly palatable dish.

### BOILED LETTUCE

Wash four or five heads of lettuce, carefully removing thick, bitter stalks and retaining all sound leaves. Cook in plenty of boiling salted water for 10 or 15 minutes, then blanch in cold water for a minute or two. Drain, chop lightly, and heat in a stewpan with some butter, and salt and pepper to taste. If preferred, the chopped lettuce may be heated with a pint of white sauce seasoned with salt, pepper, and grated nutmeg. After simmering for a few minutes in the sauce, draw to a cooler part of the range and stir in the well-beaten yolks of two eggs. See, also, "Peas with lettuce."

### Swiss Chards

This vegetable is a variety of beet in which the leaf stalk and midrib have been developed instead of the root. It is cultivated like spinach, and the green,



tender leaves are prepared exactly like this vegetable. The midribs of the full-grown leaves may be cooked like celery.

### Beet Greens

Beets are usually thickly sowed, and as the young beet plants begin to grow they must be thinned out. The young plants pulled from the bed make delicious greens, particularly if the root has attained some little size. Unfortunately, of late years the leaves are attacked by insects; therefore, they must be examined leaf by leaf, and all which are infested rejected. Do not separate the roots from the leaves. Wash thoroughly in many waters. Put into a stewpan and cover generously with boiling water. Add a teaspoonful of salt for every 2 quarts of greens. Boil rapidly until tender. This will be about 30 minutes. Drain off the water, chop rather coarse, season with butter and salt.

The vegetable may be boiled with pork as directed for "Cabbage and pork."

### Asparagus

This delicious spring vegetable should be treated very simply, yet carefully.

Cut off the woody part, scrape the lower part of the stalks. Wash well and tie in bunches. Put into a deep stewpan, with the cut end resting on the bottom of the stewpan. Pour in boiling water to come up to the tender heads, but not to cover them. Add a teaspoonful of salt for each quart of water. Place where the water will boil. Cook until tender, having the cover partially off the stewpan. This will be from 15 to 30 minutes, depending upon the freshness and tenderness of the vegetable. Have some slices of well-toasted bread on a platter. Butter them slightly. Arrange the cooked asparagus on the toast,



season with butter and a little salt and serve at once. Save the water in which the asparagus was boiled, to use in making vegetable soup.

Another method of cooking asparagus is to cut all the tender part into short pieces. Add boiling water enough to just cover the vegetable and place where the water will boil. Cook until tender (about 15 minutes), season with salt and butter, and serve in the greater part of the juice.

If preferred, a cream dressing may be served with asparagus.

### Globe Artichoke

The large flower bud of the *Cynara scolymus* is known as the globe or French artichoke. The flower buds must be used before they open. The edible portion consists of the thickened portion at the base of the scales and the receptacle to which the leaf-like scales are attached. In cookery books the receptacles are always spoken of as the bottoms. The parts of the flower in the center of the bud are called the "choke" and must always be removed.

When the artichoke is very young and tender the edible parts may be eaten raw as a salad. When it becomes hard, as it does very quickly, it must be cooked. When boiled it may be eaten as a salad or with a sauce. The scales are pulled with the fingers from the cooked head, the base of each leaf dipped in the sauce and then eaten. The bottoms (receptacles), which many consider the most delicate part of the artichoke, may be cut up and served as a salad, or they may be stewed and served with a sauce. To prepare the artichoke remove all the hard outer leaves. Cut off the stem close to the leaves. Cut off the top of the bud. Drop the artichokes into boiling water and cook until tender, which will take from 30 to 50 minutes, then take up and remove the choke. Serve a dish of French salad dressing with the artichokes, which may be eaten either hot or cold. Melted butter also makes a delicious sauce for the artichokes if they are eaten hot.

## Spring Greens

After months of a very limited supply of herbaceous vegetables, which is the usual condition in the northern regions of the United States, there is a craving for "greens." In almost all localities, many of the common weeds are tender and well-flavored when very young. If one has a garden, it can be so managed that there shall be an abundance of fresh roots and greens until the time when the regular garden products are ready. There are a number of plants that may be left in the garden over winter for early spring use. Jerusalem artichokes, parsnips, salsify, leeks, and potato onions will give roots or buds as soon as the frost will permit digging. For greens there are such plants as curled green kale, and cabbage. The roots of these plants should be well earthed up, and when the real hard freezing weather comes the plants must be covered with hay or straw.

Spinach and kale, or German winter greens, may be sown in September. When the hard freezing weather comes protect them with leaves, straw, etc. Sorrel, if properly protected, will make a rapid growth as soon as anything begins to grow. It makes delicious greens by itself, or it may be cooked with other greens. It also makes a refreshing salad. The young shoots of the milkweed are almost as delicious as asparagus, when cooked according to the second method for cooking asparagus. In fact, the milkweed and asparagus may be cut up and cooked together.

The white goosefoot (*Chenopodium album*) better known by the common names "pigweed" and "lamb's-quarters," grows in almost all cultivated land. When very young it makes good greens, and should be cooked like spinach. The dandelion, when gathered before the flower bud has attained any size, makes tender greens, and is greatly liked by many people because of its pleasant, bitter flavor. The cultivated dandelion is larger leaved, more tender, and of a milder flavor, and is also a fine salad if

blanched like celery. A small bed of this vegetable will give a generous return in the spring, for the small amount of care it requires.<sup>1</sup>

The marsh marigold, commonly called "cowslip," is found in many regions in marshy places. In the early spring this plant makes good greens. Cook the same as spinach. Purslane is a weed common in most gardens and is very palatable as a pot herb. It is also cooked like spinach.

In the Southern States the young shoots of the pokeberry or poke tops are favorite greens, and are cooked like asparagus, while turnip sprouts, cabbage sprouts, and collards are favorite greens of garden origin.

In some regions of Europe young hop sprouts are much prized, being cooked like asparagus. Though eaten to some extent, they do not seem to be known to many housewives in this country.

Every locality produces some wild plants that are safe and pleasant to use as greens. It is important, however, that the wild greens shall be gathered by persons who are familiar with the plants.<sup>2</sup>

### Green Peas

This vegetable should be gathered when the seeds are about half grown, and it should be cooked as soon as possible after gathering. When the peas are thus young and tender they are best simply boiled and seasoned with salt and good butter. Some varieties of peas lack sweetness, and in this case a little sugar in the water in which they are cooked improves the flavor. Overcooking spoils the color and flavor of the vegetable. Peas should always be boiled slowly, and with the cover partially off the stewpan. It is impossible to give the exact time of cooking this vegetable, since so much depends upon the maturity of the peas, the length of time they have been picked, etc. Young, tender peas will generally cook in 20 or 30

<sup>1</sup> U. S. Dept. Agriculture, Farmers' Bul. 186, p. 18.

<sup>2</sup> For a discussion of wild plants used as pot herbs, see "Some Additions to our Vegetable Dietary," by F. V. Coville, U. S. Dept. Agr. Yearbook 1895, p. 205.



minutes, and the seasoning should be added while they are still firm and crisp. If the peas are cooked until the green color of the chlorophyll is destroyed, they are overdone and their delicate flavor is spoiled. When peas are overgrown and a little hard they should be cooked by the rule "Peas with pork." When this rule is followed a pinch of delicate, small, white onions may be added to the peas and other ingredients and will give a very savory dish.

### BOILED PEAS WITH BUTTER

Put 1 quart of shelled peas in a stewpan and add enough boiling water to cover them generously. Place over a hot fire, and when they begin to boil draw back where the water will bubble gently. Until the peas are done, cook with the cover partially off the stewpan. When the peas are tender add 1 teaspoonful of salt and 3 tablespoonfuls of good butter. Cook 10 minutes longer. If the peas are not the sweet kind add a teaspoonful of sugar with the salt and butter.

### PEAS WITH PORK

- |                         |                                       |
|-------------------------|---------------------------------------|
| 1 quart peas.           | 1 gill water ( $\frac{1}{2}$ cupful). |
| 4 ounces pork.          | 2 small white onions.                 |
| 1 tablespoonful butter. | $\frac{1}{8}$ teaspoonful pepper.     |

Cut pork into small bits. Put butter into stewpan and on the fire. When the butter is melted add the pork and cook gently until a light brown, then add the water, peas, onion, and pepper. This is a good way to cook peas when they are a little old and hard.

### PEAS WITH LETTUCE

- |                           |                           |
|---------------------------|---------------------------|
| 1 quart peas.             | 1 small onion.            |
| 2 tablespoonfuls butter.  | 1 teaspoonful sugar.      |
| 1 head lettuce—the heart. | $\frac{1}{2}$ gill water. |

Put all the ingredients into a stewpan, cover and place over the fire and cook for five minutes, tossing the vegetables several times. Now draw the pan back where the contents will simmer slowly for half an hour.



### PURÉE OF DRIED OR SPLIT PEAS

Soak 1 quart of dried peas overnight and follow the directions for purée of dried beans.

### Sugar Peas

The green pods of the sugar pea may be prepared like string beans.

Gather the pods while the seeds are still very small. String them like beans and cut into two or three lengths. Cover with boiling water and boil gently until tender. If they are young and fresh they will cook in 25 or 30 minutes. Pour off some of the water, which will serve for soup. Season with salt and butter and serve at once. When the pods are fresh and tender they have an exquisite flavor. When the seeds have grown large and the pods become tough they may be shelled and cooked like any other variety of peas. The seeds of the sugar pea are tender and fine flavored.

### Beans

Beans are served as a vegetable in three stages of growth, namely, the tender young pods, the fresh seeds, and the dried seeds. The pods are known as green or string beans and as butter beans, depending upon the variety. String beans make one of the most delicious vegetables, if young and properly cooked. They should be gathered before the seeds begin to form. In this state the bean is sweet, delicate, and tender, but not a highly nutritious food. Shelled beans, both dried and fresh, particularly the former, contain a large percentage of nitrogenous matter. The dried, ripe, shelled beans are apt to produce flatulence and sometimes colic. This trouble is largely due to the hull or skin and the germ, and may be remedied in a great measure by proper cooking, and, when possible, the removal of the hulls. The best forms in which

to eat dried beans are in soups and purée. Beans that have been thoroughly stewed or baked under the right conditions may be eaten by people who live a good deal out of doors. Fat of some kind is necessary in the cooking of beans. The fat has a softening influence on the composition of the beans, and, since this vegetable has a very small percentage of fat, it is very desirable to supply this element either when cooking or when serving the vegetable. When possible, beans should be cooked in soft water. Dried beans are always hard when raw and have a strong acrid flavor. To soften them and remove the strong flavor, the vegetable should be soaked in cold water, and then brought to the boiling point in fresh cold water. This water should be thrown away and the cooking be finished in fresh water. A little soda in the water in which the beans are soaked and in the water in which they are first scalded will help to soften and sweeten the vegetable.

### Green or String Beans

Formerly it was difficult to find the slender, stringless green beans, but to-day the progressive market gardeners make a point of raising beans of this kind. Unfortunately, not all market gardeners and farmers are progressive, and many still raise a coarse, fibrous bean that is a disappointment to the consumer. In the very early stage of the pod almost any kind of bean will be good, if properly cooked, but all except the stringless kind must have their strings carefully removed. The pods should be gathered while small and tender. If for any reason they become wilted, they must be made crisp and fresh by being soaked in cold water. The beans that are brought from the

South in cold weather are usually more or less wilted. They should be freed from strings, cut up, and soaked at least 12 hours, in cold water. They will then cook like fresh beans.

### TO BLANCH GREEN BEANS

Green beans should always be blanched. To do this drain them from the cold water and put them into water that is boiling rapidly, allowing a teaspoonful of salt to 2 quarts of water. Boil rapidly, with the cover partially off the saucepan, for 20 minutes. Turn into a colander and let cold water run upon them. They are now ready to be finished in any manner you like. The blanching can be done in the morning while the fire is good, and the beans be finished for dinner at the proper time.

### GREEN BEANS, PLAIN

1 quart beans.	1 generous tablespoonful butter.
$\frac{1}{2}$ pint water.	1 level teaspoonful salt.

String the beans if necessary and cut them into 2-inch lengths. Blanch them as directed. Drain and put in the saucepan with the water, salt, and butter. Cook for 10 minutes over a hot fire, turning the contents of the saucepan from time to time. Serve very hot. If the beans are not tender it may take 15 minutes to cook them, but under all circumstances be careful not to overcook, as this ruins the flavor. If overcooked, green beans become yellow or brown.

### GREEN BEANS BOILED WITH PORK

Boil about  $\frac{1}{4}$  pound of pork for 5 hours. Have the beans free from strings and cut about 2 inches long. Cook them with the pork until tender (about  $\frac{1}{2}$  hour).

### GREEN BEANS WITH PORK (FRENCH METHOD)

1 quart boiled beans.	1 pint hot water.
2 ounces pork.	1 teaspoonful flour.

Cut the pork into small dice and put in the stewpan. Cook slowly for 20 minutes, then add the water. Mix the flour with



a few spoonfuls of cold water; stir into the pork and water. Place the stewpan where the contents will cook slowly for 1 hour. At the end of this time add the beans and cook  $\frac{1}{2}$  hour. Taste to see if more salt is required. A tablespoonful of butter added just before serving is a great acquisition to this dish.

Butter beans, the varieties of string beans which are pale yellow in color, may be cooked like the green string beans.

### Scarlet Runner Beans

In Great Britain the scarlet runner beans, which are raised in the United States almost exclusively as an ornamental plant, are highly prized for the table. The tender green pods are "whittled" into small sections (after stringing) and cooked in water until just tender. Like other green vegetables, they lose their color and delicate flavor if overcooked. These beans are at their best seasoned only with butter and salt.

### Shelled Kidney Beans

All the varieties of this bean, when gathered while the seeds are still tender, may be cooked like the Lima beans. They may also be boiled with pork like green beans. It takes from 1 to 2 hours to cook kidney beans.

### STEWED SHELLED BEANS

1 quart shelled beans.	1 tablespoonful flour.
$\frac{1}{4}$ pound salt pork.	1 quart boiling water.
1 onion.	Salt to taste.
$\frac{1}{2}$ teaspoonful pepper.	

Cut the pork in slices and fry slowly 10 minutes in a stewpan. Add the onion, cut fine, and cook 20 minutes very slowly. Cover the beans with boiling water and boil 10 minutes. Drain off the water. Put the beans and flour in the stewpan with the



pork and onion, and stir over the fire for 5 minutes. Add the quart of boiling water and the pepper. Place the saucepan where its contents will simmer for 2 hours. Taste to see if salt enough; if not, add salt.

This method of cooking new shelled beans gives a savory and substantial dish.

### GREEN LIMA BEANS

Cover 1 quart of the shelled beans with boiling water. Place on the fire where they will boil up quickly, then draw back where they will just simmer until done. When tender pour off a part of the water. Season the beans with a teaspoonful of salt and 2 heaping tablespoonfuls of butter.

Or drain the water from the beans. Put the butter in a saucepan with 1 tablespoonful of flour. Stir over the fire until smooth and frothy, then add the beans and stir over the fire for 5 minutes. Draw back and add half a pint of water, meat stock, or milk. Simmer 10 minutes. If liked, a teaspoonful of fine herbs may be added a few minutes before serving. It will take from 45 to 60 minutes to boil the beans sufficiently.

### Dried Beans

All dried beans require the same preliminary treatment, no matter how they are to be finally cooked and served. Look them over carefully to remove all dirt and pebbles, then wash clean. Soak them overnight in plenty of cold water. In the morning pour off the water and put them in a stewpan with cold water enough to cover them generously. Let them come to the boiling point in this water, then drain. If the beans are old and hard, for each quart put a piece of soda about the size of a large bean in the water in which they are soaked overnight, also in the first water in which they are boiled.

The scalded and drained beans should be put back in the stewpan and covered generously with boiling water. Add 1 tablespoonful of salt for 1 quart of beans. They should now cook

slowly, with the cover partially off the stewpan until they have reached the required degree of tenderness. For stewed and baked beans the cooking must stop when the skins begin to crack. For beans served with a sauce, they should cook until perfectly tender, but they must not be broken or mushy. For purées and soups they should be cooked until very soft.

### PURÉE OF DRIED BEANS

Cook 1 quart of beans in water until very soft, then drain well (saving the water) and rub through a purée sieve. Put 1 pint of the strained beans in a stewpan with 2 tablespoonfuls of butter or savory drippings, 1 teaspoonful of sugar, 1 teaspoonful of salt,  $\frac{1}{4}$  of a teaspoonful of pepper, and hot milk enough to make the purée like thick mush. About  $\frac{1}{2}$  pint of milk will be right. Cook in the double boiler for 1 hour, stirring often and adding more milk if too dry. Heap the purée in the center of a hot platter. Garnish with a circle of fried sausages, pork chops, mutton chops, or any fat meat. The purée may be served as a vegetable, with any kind of meat. A soup may be made with the water in which the beans were cooked and the remainder of the strained beans.

### DRIED BEANS SAUTÉ

Cook the beans until tender, but not broken. Drain off the water and save it for soup. For 1 quart of beans put 3 tablespoonfuls of savory drippings or butter in a large-bottomed stewpan. When the fat is hot put in the drained beans, which have been seasoned with a tablespoonful of salt and  $\frac{1}{2}$  teaspoonful of pepper. Cook over a hot fire for 15 minutes, frequently turning the beans over with a fork. Cover and let them cook for  $\frac{1}{2}$  hour where they will not burn. If the beans are liked moist add a cupful of meat broth, milk, or water before putting them to cook for the last half hour.

This dish may be made more savory by frying a tablespoonful of minced chives, shallot, or onion in the butter or fat before adding the beans. A tablespoonful of fine herbs may also be added to the beans to make them more savory.

### DRIED BEANS WITH SAUCE

The well cooked and drained beans may be moistened with any good sauce and cooked for  $\frac{1}{2}$  hour.

## DRIED BEANS IN SALAD

Season the cooked and drained beans with any of the salad dressings in popular favor and serve as a salad.

## BAKED BEANS

Cook the dried beans gently until the skins begin to break, then drain off the water. Put a layer of beans in a bean pot or deep earthen dish, and on this layer, in the center of the dish, place a piece of salt pork ("streak of fat and streak of lean") having the rind side up, using for 1 quart of beans  $\frac{1}{2}$  pound of pork; the rind should be scored. Fill up the dish with the beans, and add seasonings and water to cover the beans. The simplest seasoning is 1 tablespoonful of salt and  $\frac{1}{2}$  teaspoonful of pepper to 1 quart of beans. Mix the salt and pepper with the water. If liked, a tablespoonful of mustard may be added as well as a tablespoonful or more of molasses and an onion. Instead of the pork a piece of salt or fat beef or mutton may be employed. In this case there should be from  $1\frac{1}{2}$  to 2 pounds of the meat per quart of beans. If fresh meat be used, add more salt to the beans. If, on the other hand, salt meat is used, probably 1 teaspoonful of salt will be enough.

When mutton is employed trim off every particle of the skin.

Bake the beans in a very moderate oven for 8 or 10 hours. Add a little boiling water from time to time, but never enough to bring the water beyond the top of the beans. Any kind of bean may be baked in this manner. However, the small pea bean is the best for "Boston baked beans." The Lima and large white beans are best for the deep earthen dish. Do not cover the beans while baking.

## Lentils

Lentils may be cooked in purées, soups, etc., like dried beans.

## BAKED LENTILS

1 quart lentils.	1 clove of garlic or 1 small
1 quart water.	onion.
6 ounces mixed salt pork.	1 generous teaspoonful salt.
	$\frac{1}{2}$ teaspoonful pepper.



Pick over and wash the lentils. Soak in cold water overnight. In the morning pour off the water and put the lentils in a stewpan with 2 quarts of cold water and place on the fire. As soon as the water begins to boil, the lentils will rise to the top. Take them off with a skimmer and put them in a deep earthen dish, with the pork and onion in the center. Mix the pepper and salt with a quart of boiling water and add. Put the dish in a moderate oven, and cook slowly for 4 or 5 hours. The lentils must be kept moist, and it may be necessary to add a little water from time to time. If the pork is not very salt the dish may require a little more salt.

Stewed lentils are prepared in about the same manner, but more water is used. Instead of pork, fat corned beef or the shank of a ham may be employed.

### Cowpeas

Cowpeas (a common leguminous vegetable in the southern United States), also called black-eye peas, Whip-poor-will peas, Lady peas, cornfield peas, etc., are most excellent cooked like shelled beans when green. The young pods are also served like string beans. The ripe, dry beans, which also are very palatable and nutritious, may be cooked like dry beans or lentils. A collection of recipes for cooking cowpeas was recently published by the Tuskegee Normal and Industrial Institute Experiment Station.<sup>1</sup>

### Potatoes

There are many varieties of this vegetable. Tastes differ as to the most desirable kinds. In America and in England the white, mealy varieties are the most prized. On the Continent of Europe the "Yellow Holland" is a favorite variety. The white potato, when light and dry, is of delicate flavor and thought to be easy of digestion. It is especially suited for boil-

<sup>1</sup> Tuskegee Experiment Sta. Bul. 5.



ing, steaming, and baking, and for soups and purées. The yellow potatoes are more suitable for preparations in which it is desirable that the whole or pieces of potatoes shall retain their shape when cooked. Such potatoes are the best kind to use for salads, ragouts, hash, and for the fried potato known as "Pommes de terre soufflée," which is like a Saratoga chip, except that it puffs up like a little sack filled with air. In general the yellow potato has a richer flavor than the white.

The potato is in such common use that it would seem as if all its characteristics would be well understood and it would be cooked to perfection. Unfortunately, the contrary is true, and perhaps no other vegetable is so carelessly cooked as a rule.

The potato is a starchy food that contains enough moisture in its composition to cook the starch. This moisture is in the form of a watery juice, in which is dissolved the nitrogenous matter, the various salts, sugar, gum, etc. The starch cells are surrounded and penetrated by this watery bath. In cooking, the nitrogenous juice is coagulated in part at least by the heat, the starch granules swell and burst, and the starch absorbs the watery part of the juice. When this stage is reached, if the moisture has been in the right proportion, all parts of the potato will present a light, dry, glistening appearance. Every one concedes that such a potato will not cause digestive disturbance. However, the moisture is not always in the right proportion. Ripe potatoes and potatoes grown on a well drained or sandy soil will, as a rule, be dry and mealy if properly cooked. Potatoes grown in a wet season or in a heavy, damp soil as a rule contain too large a proportion of moisture for the starch. Old potatoes that are allowed to sprout will be watery, probably owing to the withdrawal of some of the starch for food for the growing sprouts.

A poisonous substance called solanin is found in or near the skin of potatoes which have grown exposed to the sun or a strong light. Solanin also develops when potatoes are allowed to

sprout, and serious illness has been known to follow the eating of exposed and sprouted potatoes. The green color which a potato exposed to a strong light takes on is largely due to the grains of chlorophyll developed in the parts of the tuber exposed to the light. The strong flavor is probably due to some substance which develops along with the chlorophyll. It will be seen that potatoes intended for the table should not be exposed to strong light or be allowed to sprout.<sup>1</sup>

Potatoes cooked in dry heat, as by baking in the oven, roasting in ashes, frying in deep fat, or steaming in their jackets retain all their salts and other constituents, and the flavor is more pronounced and savory than when cooked in water. But potatoes so cooked must be served just as soon as they are done, or else they will become soggy and bad flavored.

Potatoes cooked in the skin should be free from any blemish and washed absolutely clean. Old potatoes, that is, potatoes that are kept into the spring and early summer, are the better for being soaked in cold water and peeled before cooking.

### BOILED POTATOES

The method and time given for boiling potatoes are the same whether the potato be peeled, partially peeled, or left with the skin intact. If a dozen or two ordinary sized potatoes are put on the fire in a large stewpan and are covered generously with boiling water, and a cover is immediately put on the stewpan, they will be cooked to the proper point in 30 minutes from the time the cover was put on the stewpan. Small potatoes will cook in 2 minutes less time, and very large potatoes will require about 35 minutes cooking. If the potatoes are to be boiled in their skins, wash them until clean and then with a sharp knife cut a narrow band of the skin from the center of the potato. Cut a little bit of the skin from each end of the potato. If the potatoes are to be peeled, use a very sharp knife and remove the thinnest possible layer. The skins may be scraped off, if preferred, and there are special knives for this purpose. Let the potatoes boil 15 minutes, then add 1 tablespoonful of salt for every dozen potatoes. When the potatoes have been cooking

<sup>1</sup> For a discussion of composition and structure of potatoes see *The Value of Potatoes as Food*, reprint from U. S. Dept. Agr. Yearbook 1900; also *Farmers' Bul.* 244, p. 13.

30 minutes, drain off every drop of water and let all the steam pass off. They are now ready to serve, though they will not be injured but in fact will be improved by being kept hot for an hour or more, if they are well ventilated in such a way that they dry rather than retain moisture.

When boiled or steamed potatoes must be kept warm for any length of time, place the stewpan on the range on a tripod or iron ring and cover the potatoes with one thickness of cheese-cloth. This will protect them from the cold air and allow the moisture to pass off.

### STEAMED POTATOES

Steamed potatoes are prepared as for boiling, and put in a closed vessel having a perforated bottom, which is then put over a kettle of boiling water. The water must be kept boiling hard every moment. They will require from 30 to 40 minutes to cook.

### BAKED POTATOES

Select potatoes having a smooth, unmarred surface. Wash perfectly clean and let them drain. Put them in an old baking pan kept for this purpose—do not crowd them—and put in a hot oven. If the oven is large and hot and the potatoes of medium size, 40 minutes will answer for the cooking. On the other hand, if the oven is filled with cold potatoes the temperature of the oven will be reduced quickly and it will require an hour to cook the potatoes. Baked potatoes should be served as soon as they are done. If they must be kept any time after the cooking is completed, break them in order that the moisture may escape. Keep them in a warm oven or covered with cheese-cloth in a stewpan.

### REHEATING POTATOES

Cold boiled, steamed, or baked potatoes may all be utilized in savory dishes. In reheating potatoes the following things must be kept in mind: The potatoes must be well seasoned to make them savory, they must be heated to as high a temperature as possible without burning them, and they must be served very hot. The cold potatoes may be sliced or be cut into small pieces, seasoned with salt and pepper and browned in a little savory drippings, or seasoned as before and heated in the



frying pan with butter or the drippings. A little minced onion, or chives, or green pepper, or a tablespoonful of fine herbs may be added.

A tablespoonful of butter and a teaspoonful of flour may be stirred over the fire until the mixture is smooth and frothy. Add to this a pint of well-seasoned potatoes and stir the mixture with a fork for 3 minutes, then add half a pint of milk and cook until thoroughly heated, being careful not to burn. A pint and a half of cold potatoes cut in cubes and seasoned with salt and pepper may be heated in a pint of the white sauce.

### ESCALLOPED POTATOES

This dish may be prepared by mixing a pint and a half of cold potatoes cut in cubes and seasoned with a teaspoonful of salt,  $\frac{1}{4}$  teaspoonful of pepper, and a pint of cream sauce. Put the mixture in a shallow baking dish, cover with grated bread crumbs, and dot with butter. Bake half an hour in a moderate oven.

### Sweet Potatoes

Southern and northern tastes differ as to what is a desirable quality in a sweet potato. In the South the moist potato is considered best. At the North the dry potato is more generally liked. The variety of potatoes grown for the northern market is commonly less sweet and moist than those grown for the South. However, long cooking will make any sweet potato moist.

### BAKED SWEET POTATOES

Wash the potatoes and bake the same as white potatoes. Small ones will bake in half an hour, while very large ones will require 1 hour or more. If the potatoes are liked very moist and sweet, bake from 1 to 2 hours, depending on size.

### BROWNED SWEET POTATOES

Boil medium sized sweet potatoes 45 minutes. Peel them and cut in halves lengthwise. Put them in a baking pan and baste with savory drippings, and season with salt. Cook them in a hot oven for 20 minutes.



### FRIED SWEET POTATOES

Cut the boiled potatoes in slices and fry brown in savory drippings. Or the potatoes may be cut in four parts lengthwise, put in a frying basket and be cooked for 10 minutes in smoking hot fat. The fat must be deep enough to cover the potatoes.

### CANDIED SWEET POTATOES

Candied sweet potatoes are very popular on southern tables, and are extremely palatable when well prepared. Cut boiled sweet potatoes into long slices, place in an earthen dish, put lumps of butter on each slice, and sprinkle with sugar. Some cooks add a little water also. Bake until the sugar and butter have candied and the potatoes are brown.

### Jerusalem Artichoke

This vegetable is in season in the fall and spring, and may be cooked like kohl-rabi and served in a white cream sauce. The artichoke may also be cooked in milk.

When this is done, cut the washed and peeled artichoke into cubes, put in a stewpan, and cover with milk (a generous pint to a quart of cubes). Add one small onion and cook 20 minutes. Beat together 1 tablespoonful of butter and 1 level tablespoonful of flour, and stir this into the boiling milk. Then season with a teaspoonful of salt and  $\frac{1}{4}$  teaspoonful of pepper, and continue the cooking  $\frac{1}{2}$  hour longer. The cooking should be done in a double boiler. The artichoke also makes a very good soup.

### Turnips

This vegetable is generally spoiled by overcooking. The flat, white summer turnip, when sliced, will cook in thirty minutes. If the cooking is prolonged beyond this time, the vegetable begins to deteriorate, growing dark in color and strong in flavor. The winter turnips require from 45 to 60 minutes.

### BOILED TURNIPS

Have the turnips peeled and sliced. Drop the slices into a stewpan with boiling water enough to cover generously. Cook until tender, then drain well. They are now ready to mash or chop. If they are to be served mashed, put them back in the stewpan; mash with a wooden vegetable masher, as metal is apt to impart an unpleasant taste. Season with salt, butter, and a little pepper. Serve at once.

### HASHED TURNIPS

Chop the drained turnips into rather large pieces. Return to the stewpan, and for a pint and a half of turnips add a teaspoonful of salt,  $\frac{1}{4}$  teaspoonful of pepper, a tablespoonful of butter, and 4 tablespoonfuls of water. Cook over a very hot fire until the turnips have absorbed all the seasonings. Serve at once. Or the salt, pepper, butter, and a tablespoonful of flour may be added to the hashed turnips; then the stewpan may be placed over the hot fire and shaken frequently to toss up the turnips. When the turnips have been cooking 5 minutes in this manner add  $\frac{1}{2}$  pint of meat stock or of milk and cook 10 minutes.

### Carrots

The carrot is valuable as a vegetable and as a flavorer. When partially grown and fresh from the ground they have a delicious flavor, and are so tender that they may be cooked without water. As the carrot grows old the flavor grows stronger, and in the majority of varieties the heart grows hard and woody. When the carrot reaches this stage, only the outer layers are desirable for food.

### CARROTS WITH WHITE SAUCE

Scrape the carrots lightly; then cut into large dice or slices. Put into a stewpan with salted boiling water, allowing a teaspoonful of salt for a quart of water, and boil until tender. The young carrots will cook in 30 minutes and the old ones in 45.

Drain, season with a little salt, put them in a vegetable dish, and pour the white sauce over them. Or the carrots may be cut into dice before cooking, and boiled and drained as directed; then put them back in the stewpan, and for every pint add 1 tablespoonful of butter, 1 teaspoonful of sugar,  $\frac{1}{2}$  teaspoonful of salt, and 1 gill of water or meat stock. Cook over a hot fire until the carrots have absorbed the seasonings and liquid.

### Parsnips

This vegetable, because of its pronounced taste, is probably not so generally liked as are most of the other roots. It is at its best in the early spring, when it has been in the ground all winter.

The simplest method of cooking the parsnip is to wash it clean, boil it, and then scrape off the skin. Now cut in slices and put in the vegetable dish. Season with salt and butter. When the parsnips are tender and just out of the ground they will cook in 35 minutes; when old it takes from 40 to 50 minutes to cook them. The cooked and peeled parsnips may be chopped rather coarse, seasoned with salt, and put into a stewpan with hot milk enough to cover them. Place the stewpan on the range where the heat is moderate.

For a pint and a half of parsnips, beat together 1 tablespoonful of butter and 1 teaspoonful of flour. Stir into the parsnips and milk. Simmer for 10 minutes. Parsnips are often cut in slices after boiling and fried in butter.

### Salsify

This vegetable is sometimes called oyster plant, because the flavor suggests that of the oyster, particularly when the boiled vegetable is sliced and fried in butter. Salsify is one of the roots that may be left in the ground over winter, thus making this vegetable available for the late summer, fall, and spring.

To prevent this root from turning dark it must be dropped, as soon as it is pared and cut, into a mixture of flour and water



made slightly acid with vinegar. For 6 good-sized roots mix together 1 tablespoonful of vinegar, 2 tablespoonfuls of flour, 1 teaspoonful of salt, and 3 pints of water. Wash and scrape the roots, then cut into slices about 3 inches long. Drop into the prepared water. Place the stewpan on the fire and cook the salsify 30 minutes, counting from the time it begins to boil. Drain and serve in a white sauce. Or mix together 1 tablespoonful of butter,  $\frac{1}{2}$  teaspoonful of salt, 1 teaspoonful of lemon juice, and 1 teaspoonful of minced parsley or chervil. Add this to the drained salsify and serve at once.

### Beets

Beets are among our most useful vegetables, since they may be had all through the summer and may also be stored in good condition for winter use. Sometimes beets are cut in small pieces, after boiling, and served with white sauce, but the most common as well as the most palatable way of serving them is with butter.

#### BEETS WITH BUTTER

Wash the beets, being careful not to break the skin. Put into a stewpan and cover generously with boiling water and boil until tender. Young beets will cook in 1 hour. As the beets grow old the time of cooking must be increased. In winter this vegetable becomes so hard it may require 4 or more hours of steady boiling to soften it. It is then only suitable for pickling in vinegar after being thoroughly boiled.

When the young beets are cooked, take them from the boiling water and drop them into cold water. Rub off the skin. Cut the beets in thin slices and season with salt and butter. Serve at once.

### Kohl-rabi, or Turnip Cabbage

This vegetable is a variety of the cabbage, but instead of the reserve nutritive matter of the plant being stored largely in the leaves or flowers, it is collected in the stem, which forms a turnip-like enlargement just



above the ground. Kohl-rabi is fine flavored and delicate, if cooked when very young and tender. It should be used when it has a diameter of not more than 2 or 3 inches. As it grows large it becomes tough and fibrous.

### BOILED KOHL-RABI

Wash and pare the vegetables, then cut in thin slices. Put into slightly salted boiling water and boil, with the cover partially off the stewpan, until the vegetable is tender. This will take from 30 to 50 minutes. Pour off the water and season with butter, salt, and pepper.

Kohl-rabi may be boiled with pork in the same way as cabbage. The cold boiled vegetable may be served as a salad.

### Celeriac

This vegetable is also known as "knot celery" and "turnip-rooted celery." The roots, which are about the size of a white turnip, and not the stalks are eaten. They are more often used as a vegetable than as a salad.

Pare the celeriac, cut in thin, narrow slices, and put into cold water. Drain from this water and drop into boiling water and boil 30 minutes. Drain, and rinse with cold water. The celeriac is now ready to be prepared and served the same as celery.

### PURÉE OF CELERIAC

1 quart of celeriac cut in dice.	1 teaspoonful salt.
2 tablespoonfuls butter.	1 gill stock or cream.
1 tablespoonful flour.	

Cook the celeriac 30 minutes in boiling water, rinse in cold water, then press through a purée sieve. Put the butter in a saucepan and on the fire. When hot add the flour and stir until smooth and frothy, and then add the strained celeriac and cook for 5 minutes, stirring frequently. Add the salt and stock or cream and cook 5 minutes longer. If the purée seems

dry, add more stock or cream. The vegetable varies as to the amount of moisture it requires. It should be eaten very hot. If used as a garnish, it is generally put in the center of the dish and the poultry or meat placed on it or around it. Otherwise it may be served on toast or fried bread as a dish by itself.

### Celery

The culture of this vegetable is so general that one can find it in large markets nearly every month of the year. Celery is at its best in the late fall and early winter, when the weather has been cold enough to crisp the blanched stalks. This plant is most useful as a salad and flavorer, but is perhaps most commonly eaten raw, without any dressing except salt, as an accompaniment of fish, meat, etc.

Only the tender, inner stalks should be eaten raw. The hard, outside stalks make a delicious and wholesome dish when properly cooked. When thus used, celery should be blanched and served with a sauce.

### STEWED CELERY

To blanch celery in cooking, remove all the leaves from the stalks. Scrape off all rusted or dark spots, cut into pieces about 3 inches long, and put in cold water. Have a stewpan of boiling water on the fire, wash and drain the celery and put in the boiling water. Add 1 teaspoonful of salt for every 2 quarts of water. Boil rapidly for 15 minutes, having the cover partially off the stewpan. Pour off the water and rinse with cold water, then drain. The celery is now ready to finish in the following manner: Put the celery in the stewpan with 1 tablespoonful of butter, and 1 teaspoonful of salt for each quart of celery. Cover and cook slowly for 15 minutes. Shake the pan frequently while the celery is cooking. Serve hot

### Onion

This vegetable is the most useful of all flavorers, and there is hardly a soup, stew, sauce, etc., that is not im-

proved by the addition of the onion flavor. As a vegetable the onion may be prepared in a variety of ways. The white onions are the most delicate and are therefore more suitable as a vegetable than the yellow or red variety. The large Spanish onions and the Bermuda onion are also delicate and suitable for a table vegetable. If the stronger onions are used for this purpose they must be thoroughly blanched.

### BOILED ONIONS IN WHITE SAUCE

Peel the onions and cut off the roots, dropping into cold water as fast as they are peeled. Drain from the cold water and put in a stewpan with boiling water to cover generously. Add a teaspoonful of salt for each quart of water. Boil rapidly for 10 minutes, with the cover partially off the saucepan. Drain off the water and cover the onion with hot sweet milk (a quart of onions will require a pint of milk). Simmer for half an hour. Beat together 1 tablespoonful of butter and 1 level tablespoonful of flour. Add 1 teaspoonful of salt and  $\frac{1}{4}$  teaspoonful of white pepper. Gradually beat in about half a cupful of the milk in which the onions are cooking. When smooth, stir the mixture into the onions and milk. Let the dish cook 10 minutes longer and serve.

### STEWED ONIONS

Cut the onions in slices and boil in salted water for 10 minutes. Drain well<sup>a</sup> and return to the stewpan.

For a quart and a half of onion, measured before it was boiled, add 2 tablespoonfuls of butter, 1 teaspoonful of salt, and  $\frac{1}{4}$  teaspoonful of pepper. Cover the stewpan and cook over a hot fire for 5 minutes, shaking the pan to prevent the onion from browning. Set the stewpan back where the contents will cook slowly for 40 minutes. Drippings may be substituted for the butter, but, of course, the dish will not be so delicate in flavor.

### Cucumbers

The cucumber is much oftener eaten in the United States as a salad than cooked, yet it is a very palatable



vegetable when stewed and served with a white sauce, or seasoned with butter, salt, and pepper, and served on toast. The pared and quartered cucumber should be cooked until tender in boiling salted water, which will require about 15 minutes, and then served as directed. Cucumbers may also be cut in slices lengthwise and fried like summer squash or eggplant.

### STEWED CUCUMBERS

Stew pared cucumbers, cut in quarters or in thick slices, for 15 minutes in a saucepan with a little water and a minced shallot or a small minced onion. Pour off the water; stir in a little flour, butter, and salt; heat for 2 or 3 minutes, and then serve.

### CUCUMBER SAUTÉ

Boil pared and quartered cucumbers for 3 minutes only. Then drain the pieces and season with salt and pepper. Roll in flour and cook in a saucepan with butter for 20 minutes. This dish may be varied by adding minced parsley, chives, and chervil about 5 minutes before the cooking is finished.

### Tomatoes

The tomato, although not very nutritious, may be classed as one of our most useful vegetables. Raw, it makes an attractive and refreshing salad and may be served by itself or in combination with other vegetables, with meat or with fish. As a vegetable the tomato may be prepared in many ways. It makes a good foundation for soups and sauces. Made into catsup or pickles it serves as a relish. The addition of a little tomato gives a pleasant, acid flavor to many soups and sauces, and also to meat, fish, and vegetable dishes. If possible the tomatoes should ripen fully on the vines, as the flavor is much better than when picked green and then allowed to ripen.



When properly canned <sup>1</sup> this vegetable keeps well and retains its natural flavor. The housekeeper who has a generous supply of canned tomatoes on hand will find them very valuable at all times of the year, but especially in the winter months when the variety of vegetables is not great.

Overcooking spoils the flavor and color of the tomato.

### TO PEEL TOMATOES

Put the ripe tomatoes into a dish and pour boiling water over them. Let them rest in the water about 1 minute; then pour the water off. The thin skin will now peel off readily.

When a quantity of tomatoes are to be peeled have a deep stewpan a little more than half filled with boiling water and on the fire where the water will continue to boil. Put the tomatoes in a frying basket and lower into the boiling water. Let the basket remain 1 minute in the water. There must, of course, be water enough to cover the tomatoes.

### STEWED TOMATOES

Peel the tomatoes and cut into small pieces. Put into a stewpan and on the fire. Boil gently for 20 minutes or  $\frac{1}{2}$  hour, counting from the time it begins to boil. Season 5 minutes before the cooking is finished. Allow for each quart of tomato one generous teaspoonful each of salt and sugar and 1 tablespoonful or more of butter.

### ESCALLOPED TOMATOES

1 pint peeled and cut tomatoes.	1 tablespoonful butter.
1 pint grated bread crumbs.	A suggestion of pepper.
1 level teaspoonful salt.	

Reserve 3 tablespoonfuls of the bread crumbs, and spread the remainder on a pan. Brown in the oven, being careful not to burn them. Mix the tomato, browned crumbs, salt, pepper, and half the butter together, and put in a shallow baking dish. Spread the unbrowned crumbs on top, and dot with the remain-

<sup>1</sup> For method of canning see U. S. Dept. Agr., Farmers' Bul. 203.

der of the butter, cut into bits. Bake in a moderately hot oven for half an hour. The top of this dish should be brown and crisp.

### TOMATO TOAST

Boil 1 quart of peeled and cut tomatoes for 10 minutes, then rub through a strainer. Return to the stewpan and add 2 level teaspoonfuls of salt,  $\frac{1}{2}$  teaspoonful of pepper, and 2 tablespoonfuls of butter. Place on the fire and cook 5 minutes. Have the bottom of a hot platter covered with well-toasted slices of bread and pour the hot tomato over it. Serve at once. A dropped or poached egg may be put on each slice of toast.

### Okra

Though okra, a variety of *Hibiscus* with mucilaginous edible pods, will grow in most parts of the United States, it is much more commonly eaten in the Southern States than elsewhere. The young pods should be boiled in salted water until tender (about 20 minutes), drained, and heated for 5 minutes with cream (a scant cup to a quart of okra), a tablespoonful of butter, and salt and pepper. Okra is also a common ingredient of soups.

The cultivation of okra, methods of serving it, and related topics are discussed in a recent publication of this Department.<sup>1</sup>

### Green Peppers

The sweet green pepper, though fairly common in our city markets, is not as widely known as a vegetable as it deserves. Sliced, it makes a very fine salad alone, or, more commonly, mixed with other salad plants like lettuce. Stuffed and baked peppers are very palatable.

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 232.

## GREEN PEPPERS STUFFED AND BAKED

Use only tender sweet peppers. For 6 medium-sized peppers make a dressing in the following manner: Soak, in cold water, enough stale bread to make 1 pint when the water is pressed out. Season this with 2 teaspoonfuls of salt, 1 tablespoonful of fine herbs, about  $\frac{1}{2}$  of a teaspoonful each of sweet basil and summer savory, and 2 tablespoonfuls of butter or savory drippings.

Cut off the stem end of the pepper and remove all the interior, being careful to take out every seed. Fill the peppers with the dressing. Place them on end in a shallow baking dish and pour around them a sauce prepared as follows: Put into a saucepan and on the fire, 1 tablespoonful of drippings. When hot, add 1 level tablespoonful of flour. Stir until smooth and brown, then add, gradually, 3 gills of meat stock or water. Season with 1 level teaspoonful of salt. Cook 5 minutes, then pour around the stuffed peppers. Put the dish in a moderately hot oven and bake the peppers 1 hour, basting often with the sauce in the dish. Peppers may also be filled with a well-seasoned dressing of chopped meat, made with or without the addition of bread crumbs or rice.

### Eggplant

This vegetable, as well as the potato and tomato, belongs to the nightshade family. Like all succulent green vegetables, it has little nutritive value. The common methods of cooking are by frying, broiling, and baking.

#### BAKED EGGPLANT

For baked eggplant make a dressing as for stuffed peppers, except that a little more salt, pepper, and butter are used. Cut the eggplant in two lengthwise, scrape out the inside, and mash it fine, then mix with the dressing and return to the shells. Place on a pan and in the oven. Cook 45 minutes.

#### FRIED EGGPLANT

For fried eggplant cut the vegetable in slices about  $\frac{1}{2}$  inch thick and pare. Sprinkle the slices with salt and pile them



upon one another; put a plate with a weight on top of the slices. Let them rest for an hour, then remove weight and plate. Add 1 tablespoonful of water,  $\frac{1}{2}$  tablespoonful of salt, and  $\frac{1}{2}$  teaspoonful of pepper to an egg. Beat well. Dip the slices of eggplant in the egg, then in dried bread crumbs. Spread on a dish for 20 or more minutes. Fry till brown (in deep fat).]

### BROILED EGGPLANT

The eggplant is sliced and drained as directed above. Then spread the slices on a dish, season with pepper, and baste with salad oil, sprinkle with dried bread crumbs and broil.

### Squash

The various varieties of the summer squash are generally cooked when so small and tender that the thumb nail can pierce the rind easily.

To prepare for the table wash the squash, cut into small pieces, and either cook in boiling water or steam it. It will cook in boiling water in half an hour. It takes about an hour to cook it in the steamer. The cooked squash is mashed fine and seasoned with salt, pepper, and butter. This method gives a delicate-flavored but rather watery dish.

Summer squash is very palatable cut in slices and fried like eggplant.

It is claimed by many that the very young summer squashes, particularly the turban variety, or "cymlin" of the Southern States, are very delicate and palatable cooked whole. For this dish they should not be much larger than a silver dollar. In the opinion of the writer the crook-necked and other summer squashes are richer in flavor when grown to a large size. From the more mature squash remove the thin skin and seeds. Cut the squash in small pieces and put in a stewpan with boiling water enough to cover. Boil for half an hour. Drain, mash, and season with salt, pepper, and butter.

Cook winter squash in the same manner. Squash is one of the vegetables that require a good deal of butter.



### Green Corn

Green corn, a typical American food product, is a vegetable which, for most palates, is easily spoiled by overcooking, since the longer the cooking period the less pronounced the delicate corn flavor.

#### BOILED CORN ON THE COB

The most satisfactory way to serve green corn is on the cob. Free the corn from husks and "silk." Have a kettle of water boiling hard, drop the corn into the water and cook 10 minutes. If only a few ears of corn are put in a kettle of boiling water, the temperature of the water is not lowered greatly and the corn will cook in 8 minutes. On the other hand, if a large quantity of corn is crowded into a kettle of boiling water, the temperature is greatly lowered and the time of cooking must be increased. When possible, surround the corn with a generous quantity of boiling water.

#### CORN CUT FROM COB

Corn may be cut from the cob and heated with butter, pepper, and a little milk. For this dish cook the ears 5 minutes in boiling water to set the juice. Then with a sharp knife cut through the center of each row of grains, and with the back of a case knife press the grains of corn from the hulls. Put the corn in a saucepan and season with salt, pepper, and butter. Add enough hot milk to moisten well, and cook 10 minutes. Serve at once.

The raw corn may be cut from the cob and treated in the same manner.

#### SUCCOTASH

To a pint of corn cooked as above, add a pint of cooked and seasoned shelled beans.

### Vegetable Hash

Hash may be made with one or many cooked vegetables, the vegetable or vegetables being used alone or combined with meat or fish. Potato is the most

useful vegetable for a hash, as it combines well with animal food or with other vegetables.

The conditions essential to a good hash are that the vegetables shall be cut fairly fine, but not so fine that the pieces shall lose their shape or stick together—that is, the particles should drop apart readily when shaken on a fork. Each vegetable must be cut up separately, then all be mixed. The vegetables, or vegetable and meat or fish, must be well seasoned with salt and pepper, and if liked there may be added a little minced onion, chives, parsley, chervil, or green pepper finely minced. The hash must be moistened a little with meat broth, milk, or water (not more than half a cupful for a quart of hash). When the hash is mixed, seasoned, and moistened put a tablespoonful of butter or savory drippings in a frying pan. When this is melted put in the hash, and spread evenly and lightly in the pan. Over this put little dots of butter or savory drippings, using about 1 tablespoonful in all. Cover the pan and place where the hash will not burn, but where the heat is fairly good, and cook half an hour, then fold and turn on a hot platter. A rich brown crust will have formed on the bottom of the hash if the heat was sufficient. Serve very hot. The plates on which hash is served should be hot.

### Rice

Wash 1 cupful of rice in several waters, rubbing the grains between the hands to remove all the dirt. Put the washed rice in a stewpan with  $2\frac{1}{2}$  cupfuls of water and 1 teaspoonful of salt. Cover and place where the water will boil. Cook for 20 minutes, being careful not to let it burn. At the end of this time put the stewpan on a tripod or ring, and cover the rice with a fold of cheese-cloth. Let it continue to cook in this manner an hour, then turn into a hot vegetable dish. The rice will be tender, dry, and sweet, and each grain will be separate. During the whole process of cooking, the rice must not be stirred. If a

tablespoonful of butter is cut up and sprinkled over the rice when it has cooked 20 minutes the dish will be very much improved.

### Hominy and Corn Meal

The large hominy, which is so common in the southern part of the United States, is frequently served as a vegetable, either boiled or fried in drippings. Fine hominy, which is more common in the northern part of the country, and which is often served as a vegetable, should be thoroughly washed, and cooked in boiling water in the proportion of 1 gill of hominy to a pint of water, to which a half teaspoonful of salt has been added. When cold, the boiled hominy may be cut in slices and fried. The slices will brown more readily if they are first rolled in flour.

Fried corn-meal mush is often served as a vegetable, with chicken and other meats, and is very palatable and useful when fresh vegetables are not common. It is interesting to note that in the Southern States rice and hominy are much oftener used as starchy vegetables in place of potatoes than in other parts of the country.

### Vegetable Soups

Nearly every vegetable grown may be employed in the preparation of soups, either as the foundation for the soup or as a garnish to any kind of meat stock. A few types of vegetable soups are here given. Meat, meat broth, or beef extract may be added to any of them if additional flavor is desired, but as they stand they are very satisfactory soups.



## MIXED VEGETABLE SOUP

3 quarts water.	2 tomatoes.
1 quart shredded cabbage.	2 tablespoonfuls minced celery
1 pint sliced potato.	2 tablespoonfuls green pepper.
$\frac{1}{2}$ pint minced carrot.	2 tablespoonfuls butter or
$\frac{1}{2}$ pint minced turnip.	drippings.
$\frac{1}{2}$ pint minced onion.	3 teaspoonfuls salt.
1 leek.	$\frac{1}{2}$ teaspoonful pepper.

Have the water boiling hard in a stewpan and add all the vegetables except the potatoes and tomatoes. Boil rapidly for 10 minutes, then draw back where it will boil gently for 1 hour. At the end of this time add the other ingredients and cook 1 hour longer. Have the cover partially off the stewpan during the entire cooking. This soup may be varied by using different kinds of vegetables.

## HERB SOUP

$\frac{1}{2}$ pint finely shredded spinach.	3 level teaspoonfuls salt.
$\frac{1}{4}$ pint shredded sorrel.	4 tablespoonfuls butter.
$\frac{1}{4}$ pint blanched and sliced leek.	1 tablespoonful chervil.
The white heart leaves of a head	2 quarts boiling water.
of lettuce.	$\frac{1}{2}$ pint bread cut in dice and
4 potatoes, medium size.	fried in butter or browned
	in the oven.

Have the sorrel, spinach, and lettuce fresh, tender, and free from tough midribs. Wash and shred. Cut the washed leek into thin slices. Put in the stewpan with the butter and cook 15 minutes, being careful not to brown. Now add the potatoes, salt, and boiling water. Place the stewpan where the contents will boil quickly, and when the soup begins to boil draw the stewpan back where the contents will boil gently for 1 hour. At the end of this time crush the potatoes with a fork, add the chervil, and simmer 5 minutes longer. Turn into the soup tureen, add the crisped bread, and serve.

If preferred, the soup may be rubbed through a purée sieve, returned to the fire, and when boiling hot be poured on the yolks of 2 eggs which have been beaten with 2 tablespoonfuls of milk.

This soup may be varied indefinitely. Any number of green

vegetables can be employed in making it, care being taken to use only a small quantity of those of pronounced flavor.

### SORREL SOUP

3 pints boiling water.	1 teaspoonful salt.
3 tablespoonfuls butter.	Yolks 2 eggs.
$\frac{1}{3}$ cup shredded sorrel.	$\frac{1}{2}$ cupful bread cut in dice and
3 tablespoonfuls milk.	dried in the oven or fried in
	butter.

Tear the tender green parts from the midribs of the cultivated sorrel; wash in cold water and shred very fine. Put half the butter in a stewpan and add the shredded sorrel. Place on the fire and cook 5 minutes, stirring frequently. Now add the boiling water and salt and boil 10 minutes. Beat the yolks of the eggs well, then add the milk and pour into the soup tureen, and add the remaining half of the butter cut into bits. Gradually pour the boiling-hot soup in the soup tureen, stirring all the while to combine the hot mixture with the egg yolk. Add the bread dice and serve.

### LEEK SOUP

3 quarts boiling water.	3 teaspoonfuls salt.
2 cupfuls leeks, cut fine.	$\frac{1}{2}$ teaspoonful pepper.
4 cupfuls potatoes, cut in dice.	4 slices stale bread cut in small
2 tablespoonfuls butter or drip-	pieces.
pings.	4 tablespoonfuls minced onion.

Wash the leeks and cut off the roots. Cut the white part in thin slices. Pare the potatoes and cut in dice. Put them in a bowl of cold water. Put the butter, leeks, and onion in the soup pot and on the fire. Cook 20 minutes slowly, stirring frequently, then add the hot water, potatoes, and seasoning, and cook at least half an hour longer. Serve very hot. If it is convenient and liked, cook, with the leeks and butter, the white stalks of 4 or 5 cibols, or 1 shallot may be cut fine and cooked with the leeks.

This is a delicious and wholesome soup, and is even better reheated the second day than the first.

## CREAM OF LEEK SOUP

Make this soup as directed for leek soup, using only 3 pints of water. When it is cooked, rub through a sieve, return to the soup pot, and add 1 quart of hot milk. Beat with whisk until smooth. Half a cupful of the milk can be reserved cold and added to 2 well-beaten yolks of eggs. Stir this into the soup just as it is taken from the fire.

The yolks of the eggs make the soup very much richer.

## POTATO SOUP

8 medium-sized potatoes.	1½ teaspoonfuls salt.
½ pint chopped celery.	½ teaspoonful pepper.
4 tablespoonfuls minced onion.	1 teaspoonful minced chervil
1 tablespoonful butter.	or parsley.
1 tablespoonful flour.	1 quart milk.

Pare the potatoes and put in a stewpan with the celery and onion. Cover with boiling water and put over a hot fire. Cook 30 minutes, counting from the time the pan is put over the fire. Reserve half a cupful of the milk cold, and put the balance to heat in the double boiler. Mix the flour with the cold milk and stir into the boiling milk. When the potatoes, etc., have been cooking 30 minutes pour off the water, saving it to use later. Mash and beat the vegetables until light and fine, then gradually beat in the water in which they were boiled, rub through the purée sieve and then put back on the fire. Add the salt and pepper. Beat with an egg whisk for 3 minutes, then gradually beat in the boiling milk. Add the butter and minced herbs and serve at once.

## CREAM OF CELERIAC SOUP

1 quart celeriac cut in cubes.	2 tablespoonfuls butter.
1 quart white stock.	2 tablespoonfuls salt.
1 pint cream.	½ tablespoonful pepper.
½ pint canned peas.	Yolks of 2 eggs.

Follow the rule for purée of celeriac, gradually adding the hot white stock, rub through a fine sieve, return to the fire,



and add a cupful of canned peas. Reserve 1 cupful of the cream cold and add the remainder to the soup. Beat the yolks of the eggs well and add the cold cream to them, then stir the mixture into the soup. Draw back from the fire and beat with the whisk for 1 minute, then serve at once.

### TOMATO SOUP

1 quart peeled and finely cut tomatoes.	$\frac{1}{2}$ teaspoonful pepper.
1 quart cold water.	2 tablespoonfuls butter.
1 onion.	4 tablespoonfuls cornstarch.
1 tablespoonful sugar.	1 tablespoonful flour.
2 teaspoonfuls salt.	

Mix the cornstarch with the water and put into a stewpan with all the other ingredients, except the butter and flour, the onion being left whole. Stir frequently until the soup boils, then cook half an hour, counting from the time it begins to boil. At the end of this time, beat the butter and flour together until light and smooth and stir into the soup. Cook 10 minutes longer, then take out the onion and serve the soup with toasted or fried bread. If a smooth soup is desired, strain through a fine sieve. This is the simplest kind of tomato soup. It may be varied by the addition of rice, macaroni, beans, peas, and other vegetables. Instead of the fried bread, stale bread may be cut in small pieces and put in the bottom of the soup tureen.

### OKRA AND TOMATO SOUP

1 pint sliced okra.	1 green pepper, seeds removed
$1\frac{1}{2}$ pints tomatoes pared and cut fine.	and pepper cut fine.
2 quarts water.	3 teaspoonfuls salt.
3 tablespoonfuls rice.	$\frac{1}{4}$ teaspoonful pepper.
3 tablespoonfuls minced onion.	

Put all the ingredients into the soup pot and cook gently for 2 hours, then add 2 tablespoonfuls of butter or sweet drippings and serve. The bones from roast meat or broiled meat, cooked with this soup, add to the flavor.

## ONION CHOWDER

- |                               |                                   |
|-------------------------------|-----------------------------------|
| 3 quarts boiling water.       | $\frac{1}{2}$ teaspoonful pepper. |
| 1 pint minced onion.          | 3 tablespoonfuls butter or sav-   |
| 1 quart potatoes cut in dice. | ory drippings.                    |
| 3 teaspoonfuls salt.          | 1 tablespoonful fine herbs.       |

Cook the onion and butter together for half an hour, but slowly, so that the onion will not brown. At the end of this time add the boiling water, potatoes, salt, and pepper and cook 1 hour longer, then add the fine herbs and serve.

## GREEN PEA SOUP

- |                       |                                   |
|-----------------------|-----------------------------------|
| 1 quart shelled peas. | 2 tablespoonfuls butter.          |
| 3 pints water.        | 1 tablespoonful flour.            |
| 1 quart milk.         | 3 level teaspoonfuls salt.        |
| 1 onion.              | $\frac{1}{2}$ teaspoonful pepper. |

Put the peas in a stewpan with the boiling water and onion and cook until tender, which will be about half an hour. Pour off the water, saving for use later. Mash the peas fine, then add the water in which they were boiled, and rub through a purée sieve. Return to the saucepan, add flour and butter, beaten together, and the salt and pepper. Now gradually add the milk, which must be boiling hot. Beat well and cook 10 minutes, stirring frequently.

## SPLIT PEA SOUP

- |                                |                         |
|--------------------------------|-------------------------|
| 1 pint split peas.             | 1 tablespoonful flour.  |
| 4 quarts water.                | 1 tablespoonful butter. |
| $\frac{1}{2}$ pound salt pork. | 1 teaspoonful pepper.   |
| 1 large onion.                 | 1 sprig parsley.        |
| 2 tablespoonfuls celery.       |                         |

Pick the peas over, that there may be no blemished ones among them, then wash and soak in cold water overnight. In the morning turn off the water and put them in the soup pot, with the cold water and salt pork. Simmer gently 7 hours, being careful that the soup does not burn. When it has cooked 6 hours add the seasoning. Have a large wooden spoon to stir the soup. When done it should be thin enough to pour. By boiling it may become too thick; if so, add boiling water. When

thoroughly cooked, the soup is smooth and rather mealy. If not cooked enough, after standing a few minutes the thick part will settle, and the top look watery. At the end of 7 hours strain the soup through a sieve and return to a soup pot. Beat the flour and butter together until creamy, then stir into the soup and simmer half an hour longer. If the salt pork has not seasoned the soup sufficiently, add a little salt. For some tastes the soup would be improved by the addition of a quart of hot milk.

Serve little squares of fried bread in a separate dish.

### DRIED BEAN SOUP

1 pint dried beans.	3 tablespoonfuls flour.
4 quarts water.	1 tablespoonful minced celery
1 large onion, minced fine.	or a few dried celery leaves.
4 tablespoonfuls sweet drippings,	$\frac{1}{2}$ teaspoonful pepper.
or butter, which gives a better	2 teaspoonfuls salt.
flavor.	

Wash the beans and soak them overnight in cold water. In the morning pour off the water and put them in the soup pot with 3 quarts of cold water. Place on the fire and when the water comes to the boiling point pour it off (throw this water away). Add 4 quarts of boiling water to the beans and place the soup pot where the contents will simmer for 4 hours. Add the celery the last hour of the cooking. Cook the onion and drippings slowly in a stewpan for half an hour. Drain the water from the beans (save this water) and put them in the stewpan with the onions and the drippings. Then add the flour and cook half an hour, stirring often. At the end of this time mash fine, and gradually add the water in which the beans were boiled, until the soup is like thick cream. Then rub through a purée sieve and return to the fire; add the salt and pepper and cook 20 minutes or more. Any kind of beans may be used for this soup; the Lima beans give the most delicate soup, but the large or small white beans are very satisfactory and are less expensive than the Limas.

In cold weather the quantities of beans and flavorings may be doubled, but only 6 quarts of water are used. The resulting thick soup can be kept in a cold place, and a portion boiled up as required and thinned with meat stock or milk.







about to be served. These 3 herbs combine well with almost any vegetable, fish, or meat. In general, herbs should be washed, placed on a clean board, and cut with a sharp knife.

Chervil and tarragon, when employed in soup or salad, should be torn leaf by leaf into small pieces.

### TARRAGON VINEGAR

Strip about 3 ounces of leaves from the branches of tarragon; put into a quart fruit jar and fill with good vinegar. Close and let stand for about 20 days, then strain. The best vinegar to use for this purpose is white wine vinegar, but good cider vinegar will also answer. The best time to make tarragon vinegar is about the last of August, when the plants are large and vigorous. Tarragon vinegar may be used for salads and sharp sauces, when the fresh herb is not available.

### BUTTER WITH VEGETABLES

It is almost universally conceded that vegetables require the addition of fat in order that they may be at their best, and there is no fat which is so suitable as butter for the majority of vegetables, judged by the texture of the dish and also by the flavor.

The American housekeeper has a way of looking upon the use of butter, milk, cream, and eggs in the preparation of vegetables, soups, and sauces as if these ingredients were simply "trimmings" and not food. But it should be remembered that these articles are valuable foods and naturally increase the food value of the dish of which they form a part. They are all wholesome, and, although almost always more expensive than the vegetable foods with which they are combined, their use in reasonable quantities is certainly to be recommended.

Increasing the cost of the dish by the free use of butter, cream, etc., may after all be economy if the increase is intelligently made, and if the vegetable soups, purées, etc., made "hearty" as well as appetizing by the addition of butter, eggs, etc., are combined with smaller quantities of meat and with light and simple desserts.

### SAVORY DRIPPINGS

As a substitute for butter in seasoning vegetables there is nothing better than sweet savory drippings. Not all meats



supply fats that are savory in the sense in which the word is employed here. The following fats may be employed alone or in combination for seasoning vegetables: The fat from fried sausages, ham, bacon, and pork, and from roast pork, veal, and chicken. Fats trimmed from poultry, veal, pork, and ham may be fried out carefully and saved for use in cooking vegetables. Such fats have a flavor which comes from seasoning, as in sausage, from smoke, as in ham and bacon, or from brown material, as in roast meat. The fat skimmed from the water in which poultry has been boiled and the fats skimmed from the gravies of most roast meats may be clarified and also employed in the preparation of vegetables for the table. Great care must be taken that all these fats are clean and sweet, and that the temperature at which they are fried out shall not be so high as to impair the flavor. Burned or scorched fat is not only unpleasant in flavor, but is a frequent cause of indigestion.

When rendering the trimmings of fat meat, add a small onion or a shallot (do not cut them), a few leaves of summer savory, and thyme, a teaspoonful of salt, and a little pepper. This seasoning is enough for half a pint of fat. Keep the drippings covered, and in a cool, dry place.

### CREAM SAUCE

$\frac{1}{2}$ pint milk.	$\frac{1}{2}$ teaspoonful salt.
1 tablespoonful butter.	$\frac{1}{4}$ teaspoonful pepper.
1 teaspoonful flour.	

Heat the milk over boiling water; beat the butter and flour to a cream and stir into the hot milk. Cook 5 minutes, then add salt and pepper, and use. This sauce is suitable for boiled cauliflower, potatoes, carrots, etc. It is also a good sauce for escaloped dishes. This sauce may be modified by the addition of flavoring herbs.

### CREAM MUSTARD SAUCE

Make the cream sauce as directed above. Mix 1 tablespoonful of mustard with a teaspoonful of cold water and stir into the sauce about 2 minutes before serving. The quantity of mustard may be increased or diminished, as one may desire the flavor strong or mild.





fresh tarragon is not available, tarragon vinegar may be employed.

### LETTUCE SALAD WITH CREAM DRESSING

1 large solid head lettuce.	$\frac{1}{4}$ teaspoonful pepper.
1 tablespoonful vinegar.	4 tablespoonfuls thick, sweet
$\frac{1}{2}$ teaspoonful salt.	cream.

Remove the outer leaves from the head of lettuce, leaving only the crisp, clean, bleached leaves. Break the leaves one by one from the head, and if perfectly clean do not wash them. If not clean, wash quickly in cold water and drain. Tear each leaf into 3 or 4 pieces; put the shredded lettuce into a large towel or napkin and place on the ice or in a cold cellar. At serving time put the lettuce in a salad bowl. Mix the salt, pepper, and vinegar in the salad spoon and sprinkle over the lettuce; stir well, then add the cream, a spoonful at a time, and mix by tossing the lettuce lightly with the spoon and fork. Serve immediately.

### CABBAGE SALAD

Either red or white cabbage may be used for salad, and must be firm, crisp, and tender. Remove the outer leaves and cut the tender cabbage into fine shreds. Wash well and let soak in cold water for half an hour. Drain and season with French dressing or cooked salad dressing. Serve at once.

### CUCUMBER SALAD

This vegetable should always be crisp and fresh when used. There is an old and widespread belief that cucumbers are more wholesome if the slices are soaked in cold water or in salted water before serving. Doubtless the distress which some persons experience after eating cucumbers is due to the fact that they are swallowed without proper mastication. It does not seem probable that there is any unwholesome property in this vegetable when we recall the extent to which it is eaten in some other countries and the good reputation which it bears there. In Persia the cucumber is most highly prized and is consumed in very large quantities. On account of its succulent character it is often used by travelers in place of water, as the water supply in many villages and towns is not above suspicion.



Cucumbers should be pared and sliced thin, and then may be dressed with oil and vinegar, like lettuce, or with a little vinegar, salt, and pepper. Cucumbers are at their best for salads when fairly young, and should not be used after the seeds have become hard and tough, as most persons consider them objectionable. A pleasant variation in the appearance of the dish may be easily obtained by slicing rather small cucumbers lengthwise instead of across, as is the more common method.

### Dressings or Sauces for Salads

#### FRENCH DRESSING

1 tablespoonful vinegar.	$\frac{1}{4}$ teaspoonful salt.
4 tablespoonfuls olive oil.	$\frac{1}{8}$ teaspoonful pepper.

Put the salt and pepper in the salad bowl, or in a small bowl if the sauce is to be served separately. Add a little oil and stir well, then gradually add the remainder of the oil, stirring all the while. Last of all stir in the vinegar, which should be diluted with water if very strong.

This sauce may be modified to suit different vegetables. As it is given it is right for lettuce, chicory, cooked asparagus, cauliflower, artichoke, etc.

Cream may be substituted for the oil, but the salad is not so rich.

#### COOKED SALAD DRESSING

2 eggs.	1 teaspoonful salt.
1 gill vinegar.	1 teaspoonful mustard.
2 gills milk.	$\frac{1}{4}$ teaspoonful pepper.
1 tablespoonful oil or butter.	

Put the oil and dry ingredients into a bowl and mix well. Add the eggs and beat for 5 minutes, then add the vinegar and beat 1 minute. Now add the milk, place the bowl in a pan of boiling water, and cook until the sauce thickens like thin cream. It will take about 10 minutes. Stir the sauce constantly while cooking. Cool and bottle what you do not require for immediate use. This sauce is good for nearly all kinds of cooked vegetables.

If butter is substituted for the oil, add it just before taking the sauce from the fire.





digested as the better cuts broiled or roasted, has been satisfactorily answered by work which has been done as part of the nutrition investigations of the Office of Experiment Stations. The results obtained show that, so far at least as present knowledge is concerned, there is practically no difference between the various cuts of meat or the meats from different animals with respect to either the thoroughness or the ease with which they are digested. Over 95 per cent of the protein and of the fat of all kinds and cuts of meat is digested by the body under normal conditions, which means that meat is a very thoroughly assimilated food and that there are no marked differences in the thoroughness with which different sorts are digested. The experimenters say: "It is commonly said that meats of different sorts vary decidedly in digestibility; for instance, that red meat is less digestible than white meat, or pork than beef, or that a cheaper cut is less digestible than a tender steak. As regards the thoroughness of digestion, the results of the extended series of tests reported show that such differences do not exist in any appreciable degree and that meat of all kinds and cuts is to be classed with the very digestible foods." Therefore, those who wish to use the cheaper cuts need not feel that in so doing their families are less well nourished than by the more expensive meats.

### **Apparent and Actual Cost of Meat in Different Cuts**

The relative retail prices of the various cuts usually bear a direct relation to the favor with which they are regarded by the majority of persons, the juicy tender cuts of good flavor selling for the higher prices. When porterhouse steak sells for 25 cents a pound, it may be



assumed that in town or village markets round steak would ordinarily sell for about 15 cents, and chuck ribs, one of the best cuts of the fore quarter, for 10 cents. This makes it appear that the chuck ribs are less than half as expensive as porterhouse steak and two-thirds as expensive as the round. But apparent economy is not always real economy, and in this case the bones in the three cuts should be taken into account. Of the chuck ribs, more than one-half is bone or other materials usually classed under the head of "waste" or "refuse." Of the round, one-twelfth is waste, and of the porterhouse one-eighth. In buying the chuck, then, the housewife gets, at the prices assumed, less than  $\frac{1}{2}$  pound of food for 10 cents, making the net price of the edible portion 22 cents a pound; in buying round, she gets  $\frac{1}{12}$  pound for 15 cents, making the net value about  $16\frac{1}{2}$  cents; in buying porterhouse, she gets  $\frac{7}{8}$  pound for 25 cents, making the net value about  $28\frac{1}{2}$  cents a pound. The relative prices, therefore, of the edible portions are 22,  $16\frac{1}{2}$ , and  $28\frac{1}{2}$  cents; or to put it in a different way, a dollar at the prices assumed will buy  $4\frac{1}{2}$  pounds of solid meat from the cut known as chuck, 6 pounds of such meat from the round, and only  $3\frac{1}{2}$  pounds of such meat from the porterhouse. To this should be added the fact that because of the way in which porterhouse is usually cooked no nutriment is obtained from the bone, while by the long slow process by which the cheaper cuts, except when they are broiled or fried, are prepared the gelatin, fat, and flavoring material of the bone are extracted. The bones of meats that are cooked in water, therefore, are in a sense not all refuse, for they contain some food which may be secured by proper cookery.

It is true, of course, that the bones of the steaks may





acid, that acid to which the sourness of vinegar is due. For this reason it is possible to make meat more tender by soaking it in vinegar or in vinegar and water, the proportions of the two depending on the strength of the vinegar. Sour beef or "sauerkraut," as it is known to Germans, is a palatable dish of this sort for which the recipe is given elsewhere in this chapter. Since vinegar is a preservative, this suggests a method by which a surplus of beef may be kept for several days and then converted into a palatable dish.

Flavor in meat depends mainly on certain nitrogenous substances, which are called extractives because they can be dissolved out or "extracted" by soaking the meat in cold water. The quality of the extractives and the resulting flavor of the meat vary with the condition of the animal and the different parts of its body. They are usually considered better developed in older than in very young animals. Many persons suppose extractives or the flavor they cause are best in the most expensive cuts of meat; in reality, cuts on the side of beef are often of better flavor than tender cuts, but owing to the difficulty of mastication this fact is frequently not detected. The extractives have little or no nutritive value in themselves, but they are of great importance in causing the secretion of digestive juices at the proper time, in the right amount, and of the right chemical character. The digestive tract may be likened to a piece of machinery, which is beautifully built and adjusted, and is ready to run and turn out its product as soon as a lever is moved which sets it in motion. The flavoring bodies of food, and especially those contained in meat, can be likened to the lever which sets the machinery in motion. Excitants to normal digestion are supplied by other foods as



well, but meats, so physiologists believe, are especially important for the purpose. It is this quality which justifies the taking of soup at the beginning of a meal and the giving of broths, meat extracts, and similar preparations to invalids and weak persons. These foods have little nutritive material in themselves, but they are great aids to the digestion of other foods.

The amount of the extractives which will be brought out into the water when meat is boiled depends upon the pieces into which the meat is cut and on the length of time they are soaked in cold water before being heated. A good way to hinder the escape of the flavoring matter is to sear the surface of the meat quickly by heating it in fat, or the same end may be attained by plunging it into boiling water. Such facts are known to all cooks and have recently been studied systematically at the Illinois Experiment Station in relation to the amounts removed and the losses which may be involved in different methods of cookery. Such solubility is taken advantage of in making beef tea at home and in the manufacture of meat extract, the extracted material being finally concentrated by evaporating the water.

### **General Methods of Preparing Meat for the Table**

The advantages of variety in the methods of preparing and serving are to be considered even more seriously in the cooking of the cheaper cuts than in the cooking of the more expensive ones, and yet even in this connection it is a mistake to lose sight of the fact that, though there is a great variety of dishes, the processes involved are few in number.

An experienced teacher of cooking, a woman who has made very valuable contributions to the art of cookery





shows, that slow gentle cooking results in better texture than is the case when meat is boiled rapidly. This is the philosophy that lies back of the simmering process.

When meat is cooked by roasting, broiling, or any other similar process the meat juices brown with the fat, producing substances which to most of us are agreeable to the senses of smell and taste alike. When meats are cooked in hot water such highly flavored substances are not so evident to the sense of smell, but nevertheless bodies of agreeable flavor which are perceptible to the palate are developed in the meat during the cooking process.

The question of the amount and character of the ingredients which escape from the meat and other changes occurring in it during cooking is too complicated to be discussed in detail here. Much careful experimenting along these lines has been done in experiment station and other laboratories,<sup>1</sup> and the results show that the losses vary considerably with the method of cooking employed, being of course greatest where small pieces of meat are subjected to prolonged cooking.

Among the principal conclusions drawn from the experiments referred to are the following: The chief loss in weight when meat is cooked is due to the driving off of water. When beef is cooked by pan broiling—that is, searing in a hot, greased pan, a common cooking process—no great loss of nutrition results, particularly if the fat and other substances adhering to the pan are utilized in the preparation of gravy. When beef is cooked by boiling, there is a

<sup>1</sup> U. S. Dept. Agr., Farmers' Buls. 34, 162, p. 9, and 193, p. 29; also Office of Expt. Stas. Bul. 141.



loss of 3 to 20 per cent of material present, though this is not an actual loss if the broth is utilized for soup or in some similar way. Even in the case of meat which is used for the preparation of beef tea or broth, the losses of nutritive material are apparently small though much of the flavoring matter has been removed. The amount of fat found in broth varies directly with the amount originally present in the meat; the fatter the meat the greater the quantity of fat in the broth. The loss of water in cooking varies inversely with the fatness of the meat; that is, the fatter the meat the smaller the shrinkage due to loss of water. In cooked meat the loss of various constituents is inversely proportional to the size of the cut. In other words, the smaller the piece of meat the greater the percentage of loss.

Loss also appears to be dependent somewhat upon the length of time the cooking is continued. When pieces of meat weighing  $1\frac{1}{2}$  to 5 pounds are cooked in water somewhat under the boiling point, there appears to be little difference in the amount of material found in broth, whether the meat is placed in cold water or hot water at the beginning of the cooking period. When meat is roasted in the oven, the amount of material removed is somewhat affected by the character of the roasting pan and similar factors, thus the total loss in weight is naturally greater in an open than in a closed pan as the open pan offers more opportunity for the evaporation of water. Judging from the average results of a considerable number of tests, it appears that a roast weighing 6 pounds raw should weigh 5 pounds after cooking, or in other words the loss is about one-sixth of the original weight. This means that if the raw meat costs 20 cents per pound,





studies carried on by the Office of Experiment Stations. In many families where the income was fairly good, the table and other conditions were far from satisfactory. In such cases the marketing was quite commonly done by a child or someone without knowledge or experience. In a particular instance the selection was expensive steak, which later was so badly cooked that it was hardly possible to eat it. A cheaper cut well cooked would have been much more satisfactory as well as more economical.

There is sometimes an advantage in using canned meat and meat products, and, if they are of good quality, such products are wholesome and palatable.

That economy is furthered by careful serving at table, is obvious. If more meat is given at each serving than the person wishes or habitually eats, the table waste is unduly increased. Economy in all such points is important and not beneath the dignity of the family.

In rural regions both in the United States and in Europe, farmers sometimes cooperate in the maintenance of slaughterhouses and storehouses, thus making it easier to obtain fresh meat in hot weather. In a "meat club"<sup>1</sup> in this country, which was said to be successful, the members took turns in providing animals (lambs or heifers) for the slaughtering, which was done in a special shed on three Saturdays on each month. The meat was distributed among the members according to a system previously agreed on, the different cuts going to the different members in rotation. A fixed price per pound was agreed on at the beginning of the season, and at the end of the season accounts were balanced according to the weight of the animals

<sup>1</sup> Breeder's Gaz., 53 (1908), p. 232.



provided by and of the cuts supplied to each member. Such a plan seems capable of extension to meet a variety of conditions, particularly in rural regions.

Various other phases of the question of lessening the expense for meat in the home are discussed in the following sections.

### **Lessening the Amount of Meat Used**

In many American families meat is eaten two or three times a day; in such cases the simplest way of reducing the meat bill would very likely be to cut down the amount used, either by serving it less often or by using less at a time. Deficiency of protein need not be feared when one good meat dish a day is served, especially if such nitrogenous materials as eggs, milk, cheese, and beans are used instead. In localities where fish can be obtained fresh and cheap, it might well be more frequently substituted for meat for the sake of variety as well as economy. Ingenious cooks have many ways of "extending the flavor" of meat, that is, of combining a small quantity with other materials to make a large dish, as in meat pies, stews, and similar dishes. Such dishes and their preparations are spoken of elsewhere in this chapter.

### **Buying Meat in Quantity for Home Use**

By buying in large quantities, under certain conditions, it may be possible to procure meat at better prices than those which ordinarily prevail in the retail market. The whole side or quarter of an animal can frequently be obtained at noticeably less cost per pound than when it is bought cut by cut, and can be used to advantage when the housekeeper understands the





### CLARIFYING FAT

Excepting where the purpose of clarifying fat is to remove flavors, a good method to follow is to pour water over the fat, to boil thoroughly, and then to set it away to cool. The cold fat may be removed in a solid cake and any impurities clinging to it may be scraped off, as they will be found at the bottom of the layer. By repeating this process 2 or 3 times a cake of clean, white fat may be obtained.

A slight burned taste or similar objectionable flavors often can be removed from fat by means of potatoes. After melting the fat, put into it thick slices of raw potato; heat gradually. When the fat ceases to bubble and the potatoes are brown, strain through a cloth placed in a wire strainer.

### SAVORY DRIPPINGS

When rendering the drippings of fat meat, add a small onion (do not cut it), a few leaves of summer savory and thyme, a teaspoonful of salt, and a little pepper. This is enough for a pint of fat. Keep the drippings covered and in a cool place.

### Uses for Bones

Almost any meat bones can be used in soup making, and if the meat is not all removed from them the soup is better. But some bones, especially the rib bones, if they have a little meat left on them, can be grilled or roasted into very palatable dishes. The "sparerib" of southern cooks is made of the rib bones from a roast of pork, and makes a favorite dish when well browned. The braised ribs of beef often served in high-class restaurants are made from the bones cut from rib roasts. In this connection it may be noted that many of the dishes popular in good hotels are made of portions of meat such as are frequently thrown away in private houses, but which with proper cooking and seasoning make attractive dishes and give most acceptable variety to the menu. An old recipe for "broiled

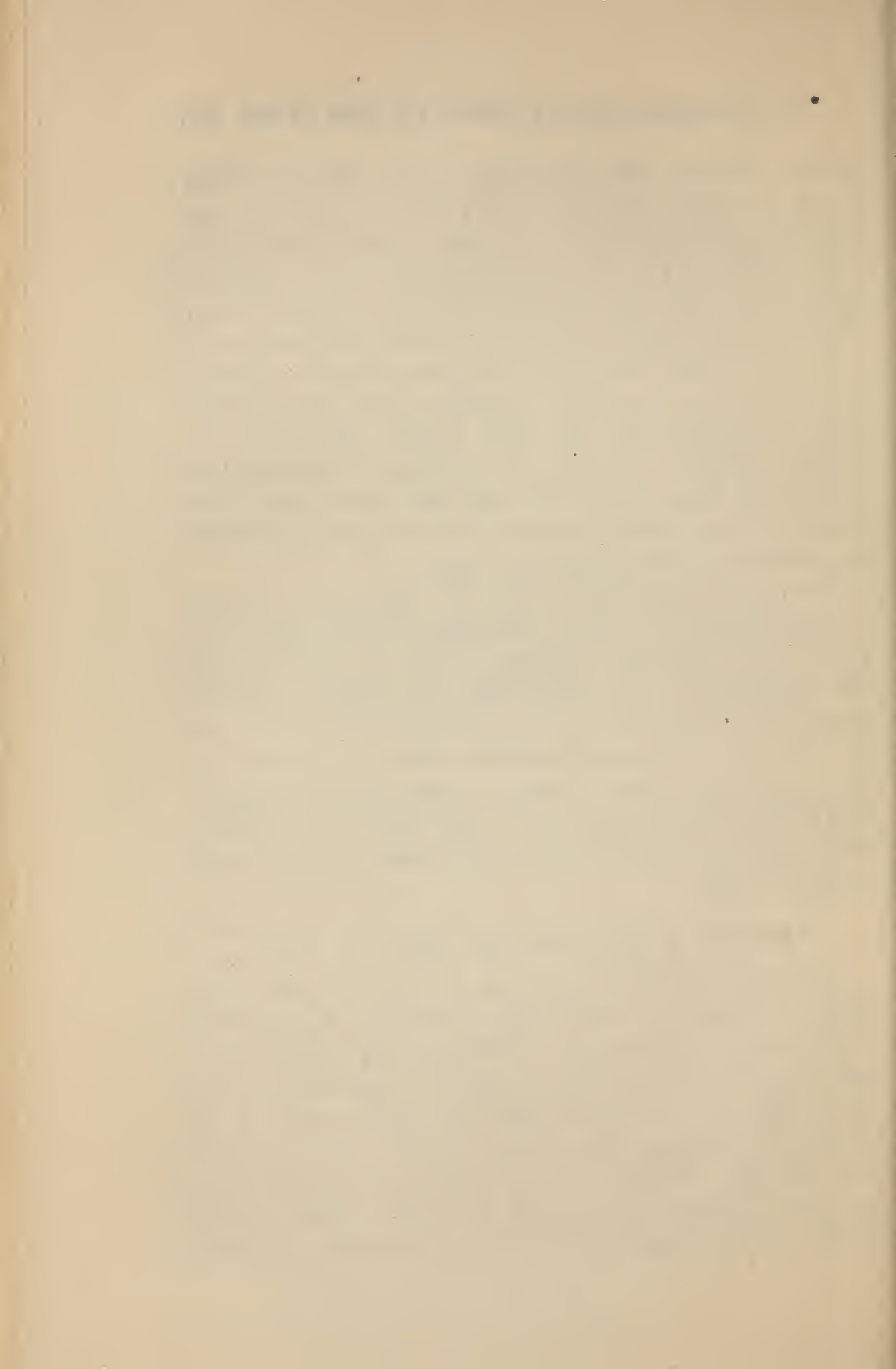


bones " directs that the bones (beef ribs or sirloin bones on which the meat is not left too thick in any part) be sprinkled with salt and pepper (Cayenne), and broiled over a clear fire until browned. Another example of the use of bones is boiled marrow bone. The bones are cut in convenient lengths, the ends covered with a little piece of dough over which a floured cloth is tied, and cooked in boiling water for 2 hours. After removing the cloth and dough, the bones are placed upright on toast and served. Prepared as above, the bones may also be baked in a deep dish. Marrow is sometimes removed from bones after cooking, seasoned, and served on toast.

Trimnings from meat may be utilized in various "made dishes," of which examples will be given further on, or they can always be put to good use in the soup kettle. It is surprising how many economies may be practiced in such ways and also in the table use of left-over portions of cooked meat, if attention is given to the matter. Many of the recipes given in this bulletin involve the use of such left-overs. Others will suggest themselves or may be found in all the usual cookery books.

### **Methods of Extending the Flavor of Meat**

Common household methods of extending the meat flavor through a considerable quantity of material which would otherwise be lacking in distinctive taste are to serve the meat with dumplings, generally in the dish with it, to combine the meat with crusts, as in meat pies or meat rolls, or to serve the meat on toast and biscuits. Borders of rice, hominy, or mashed potatoes are examples of the same principles applied in different ways. By serving some preparation of flour,





and well-beaten yolk. Stir well and cool. When cold, roll into balls. Dip in egg and crumbs and fry in deep fat. Rice may be used in a similar way.

### Meat Pies and Similar Dishes

Meat pies represent another method of combining flour with meat. They are ordinarily baked in a fairly deep dish, the sides of which may or may not be lined with dough. The cooked meat, cut into small pieces, is put into the dish, sometimes with small pieces of vegetables, a gravy is poured over the meat, the dish is covered with a layer of dough, and then baked. Most commonly the dough is like that used for soda or cream-of-tartar biscuit, but sometimes shortened pastry dough, such as is made for pies, is used. This is especially the case in the fancy individual dishes usually called patties. Occasionally the pie is covered with a potato crust, in which case the meat is put directly into the dish without lining the latter. Stewed beef, veal, and chicken are probably most frequently used in pies, but any kind of meat may be used, or several kinds in combination. Pork pies are favorite dishes in many rural regions, especially at hog-killing time, and when well made are excellent.

If pies are made from raw meat and vegetables, longer cooking is needed than otherwise, and in such cases it is well to cover the dish with a plate, cook until the pie is nearly done, then remove the plate, add the crust, and return to the oven until the crust is lightly browned. Many cooks insist on piercing holes in the top crust of a meat pie directly it is taken from the oven.

### TWELVE O'CLOCK PIE

This is made with shoulder of mutton, boiled with carrot and onion, then cut up, mixed with potatoes separately boiled and



cut up, and put into a baking dish. The crust is made by mixing smoothly mashed potatoes to which a tablespoonful of shortening has been added, with enough flour and water to make them roll out easily. A pie made of a pound of meat will require 5 or 6 small boiled potatoes, a cupful of mashed potatoes, and 8 or 10 tablespoonfuls of flour, and should be baked about 20 minutes in a hot oven. Salt, pepper, and other seasoning, as onion and carrot, may be added to taste. A teaspoonful of baking powder makes the crust lighter.

### MEAT AND TOMATO PIE

This dish presents an excellent way of using up small quantities of either cold beef or cold mutton. If fresh tomatoes are used, peel and slice them ; if canned, drain off the liquid. Place a layer of tomato in a baking dish, then a layer of sliced meat, and over the two dredge flour, pepper, and salt; repeat until the dish is nearly full, then put in an extra layer of tomato and cover the whole with a layer of pastry or of bread or cracker crumbs. When the quantity of meat is small, it may be "helped out" by boiled potatoes or other suitable vegetables. A few oysters or mushrooms improve the flavor, especially when beef is used. The pie will need to be baked from half an hour to 1 hour according to its size and the heat of the oven.

### MEAT AND PASTRY ROLLS

Small quantities of cold ham, chicken, or other meat may be utilized for these. The meat should be chopped fine, well seasoned, mixed with enough savory fat or butter to make it "shape," and formed into rolls about the size of a finger. A short dough (made, say, of a pint of flour, 2 tablespoonfuls of lard, 1 teaspoonful of baking powder, salt, and milk enough to mix) should be rolled thin, cut into strips, and folded about the meat rolls, care being taken to keep the shape regular. The rolls should be baked in a quick oven until they are a delicate brown color and served hot.

### MEAT TURNOVERS

Almost any kind of chopped meat may be used in these, and if the quantity on hand is small, may be mixed with potato or cooked rice. This filling should be seasoned to taste with salt and pepper, onion, or whatever is relished, and laid on pieces

of short biscuit dough rolled thin and cut into circles about the size of an ordinary saucer. The edges of the dough should be moistened with white of egg, and dough then folded over the meat, and its edges pinched closely together. If desired, the tops of the turnovers may be brushed over with yolk of egg before they are placed in the oven. About half an hour's baking in a hot oven is required. Serving with a brown sauce increases the flavor and moistens the crust.

### Meat with Macaroni and Other Starchy Materials

Macaroni cooked with chopped ham, hash made of meat and potatoes or meat and rice, meat croquettes—made of meat and some starchy materials like bread crumbs, cracker dust, or rice—are other familiar examples of meat combined with starchy materials. Pilaf, a dish very common in the Orient and well known in the United States, is of this character and easily made. When there is soup or soup stock on hand it can be well used in the pilaf.

#### TURKISH PILAF

$\frac{1}{2}$ cup of rice.	1 cup stock or broth.
$\frac{3}{4}$ cup of tomatoes stewed and strained.	3 tablespoonfuls of butter.

Cook the rice and tomatoes with the stock in a double boiler until the rice is tender, removing the cover after the rice is cooked if there is too much liquid. Add the butter, and stir it in with a fork to prevent the rice from being broken. A little catsup or Chili sauce with water enough to make  $\frac{3}{4}$  of a cup may be substituted for the tomatoes. This may be served as a border with meat, or served separately in the place of a vegetable, or may make the main dish at a meal, as it is savory and reasonably nutritious.

#### MEAT CAKES

1 pound chopped veal.	1 teaspoonful chopped onion.
$\frac{1}{4}$ pound soaked bread crumbs.	$1\frac{1}{2}$ teaspoonfuls salt.
2 tablespoonfuls savory fat or butter.	Dash of pepper.

Mix all the ingredients except the butter or fat and shape into small round cakes. Melt the fat in a baking pan and brown the cakes in it, first one side and then the other. Either cooked or raw veal may be used. In the case of raw meat the pan should be covered so that the heat may be retained to soften the meat.

### STEW FROM COLD ROAST

This dish provides a good way of using up the remnants of a roast, either of beef or mutton. The meat should be freed from fat, gristle, and bones, cut into small pieces, slightly salted, and put into a kettle with water enough to nearly cover it. It should simmer until almost ready to break in pieces, when onions and raw potatoes, peeled and quartered, should be added. A little soup stock may also be added if available. Cook until the potatoes are done, then thicken the liquor or gravy with flour. The stew may be attractively served on slices of crisp toast.

### Meat with Beans

Dry beans are very rich in protein, the percentage being fully as large as that in meat. Dry beans and other similar legumes are usually cooked in water, which they absorb, and so are diluted before serving; on the other hand, meats by the ordinary methods of cooking are usually deprived of some of the water originally present—facts which are often overlooked in discussing the matter. Nevertheless, when beans are served with meat the dish is almost as rich in protein as if it consisted entirely of meat.

Pork and beans is such a well-known dish that recipes are not needed. Some cooks use a piece of corned mutton or a piece of corned beef in place of salt or corned pork or bacon, or use butter or olive oil in prep ring this dish.

In the Southern States, where cowpeas are a common crop, they are cooked in the same way as dried beans. Cowpeas baked with salt pork or bacon make an



excellent dish resembling pork and beans, but of distinctive flavor. Cowpeas boiled with ham or with bacon are also well-known and palatable dishes.

Recipes are here given for some less common meat and bean dishes.

### MEXICAN BEEF

The Mexicans have a dish known as "Chili con carne" (meat with Chili pepper), the ingredients for which one would doubtless have difficulty in obtaining except in the southwestern United States. However, a good substitute for it may be made with the foods available in all parts of the country. The Mexican recipe is as follows:

Remove the seeds from 2 Chili peppers, soak the pods in a pint of warm water until they are soft, scrape the pulp from the skin and add to the water. Cut 2 pounds of beef into small pieces and brown in butter or drippings. Add a clove of garlic and the Chili water. Cook until the meat is tender, renewing the water if necessary. Thicken the sauce with flour. Serve with Mexican beans either mixed with the meat or used as a border.

In the absence of the Chili peppers, water and Cayenne pepper may be used, and onions may be substituted for garlic. For the Mexican beans, red kidney beans either fresh or canned make a good substitute. If the canned beans are used they should be drained and heated in a little savory fat or butter. The liquid may be added to the meat while it is cooking. If the dried beans are used they should be soaked until soft, then cooked in water until tender and dry, a little butter or dripping and salt being used for seasoning or gravy. White or dried Lima beans may be used in a similar way.

### HARICOT OF MUTTON

2 tablespoonfuls of chopped onions.	2 cups of water, and salt and pepper.
2 tablespoonfuls of butter or drippings.	1½ pounds of lean mutton or lamb cut into 2-inch pieces.

Fry the onions in the butter, add the meat, and brown; cover with water and cook until the meat is tender. Serve with a border of Lima beans, seasoned with salt, pepper, butter, and



a little chopped parsley. Fresh, canned, dried, or evaporated Lima beans may be used in making this dish.

### ROAST PORK WITH COWPEAS

For this dish a leg of young pork should be selected. With a sharp knife make a deep cut in the knuckle, and fill the opening with sage, pepper, salt, and chopped onion. When the roast is half done, scar the skin but do not cut deeper than the outer rind. When the meat is nearly cooked pour off the excess of fat and add a quart of *white* cowpeas which have been previously parboiled or "hulled," and cook slowly until quite done and the meat brown. Apple sauce may be served with this dish.

### Meat Salads

Whether meat salads are economical or not depends upon the way in which the materials are utilized. If in chicken salad, for example, only the white meat of chicken especially bought for the purpose and only the inside stems of expensive celery are used, it can hardly be cheaper than plain chicken. But, if portions of meat left over from a previous serving are mixed with celery grown at home, they certainly make an economical dish, and one very acceptable to most persons. Cold pork or tender veal—in fact, any white meat can be utilized in the same way. Apples cut into cubes may be substituted for part of the celery; many cooks consider that with the apple the salad takes the dressing better than with the celery alone. Many also prefer to marinate (i.e., mix with a little oil and vinegar) the meat and celery or celery and apples before putting in the final dressing, which may be either mayonnaise or a good boiled dressing.

### Meat with Eggs

Occasionally eggs are combined with meat, making very nutritious dishes. Whether this is an economy

or not of course depends on the comparative cost of eggs and meat.

In general, it may be said that eggs are cheaper than meat when a dozen costs less than  $1\frac{1}{2}$  pounds of meat, for a dozen eggs weighs about  $1\frac{1}{2}$  pounds and the proportions of protein and fat which they contain are not far different from the proportions of these nutrients in the average cut of meat. When eggs are 30 cents a dozen they compare favorably with round of beef at 20 cents a pound.

Such common dishes as ham and eggs, bacon or salt pork and eggs, and omelet with minced ham or other meat are familiar to all cooks.

### ROAST BEEF WITH YORKSHIRE PUDDING

The beef is roasted as usual and the pudding made as follows:

#### YORKSHIRE PUDDING

3 eggs.	1 cupful flour.
1 pint milk.	1 teaspoonful salt.

Beat the eggs until very light, then add the milk. Pour the mixture over the flour, add the salt, and beat well. Bake in hissing hot gem pans or in an ordinary baking pan for 45 minutes, and baste with drippings from the beef. If gem pans are used, they should be placed on a dripping pan to protect the floor of the oven from the fat. Many cooks prefer to bake Yorkshire pudding in the pan with the meat; in this case the roast should be placed on a rack and the pudding batter poured on the pan under it.

### CORNER-BEEF HASH WITH POACHED EGGS

A dish popular with many persons is corned-beef hash with poached eggs on top of the hash. A slice of toast is sometimes used under the hash. This suggests a way of utilizing a small amount of corned-beef hash which would otherwise be insufficient for a meal.

Housekeepers occasionally use up odd bits of other meat in a similar way, chopping and seasoning them and then warming and serving in individual baking cups with a poached or shirred egg on each.

### HAM AND POACHED EGGS WITH CREAM SAUCE

A more elaborate dish of meat and eggs is made by placing a piece of thinly sliced boiled ham on a round of buttered toast, a poached egg on the ham, and covering with a highly seasoned cream or a Hollandaise sauce. A slice of tongue may be used instead of the ham. If preferred, a well-seasoned and rather thick tomato sauce or curry sauce may be used.

### Stuffing or forcemeat

Another popular way to extend the flavor of meat over a large amount of food is by the use of stuffing or forcemeat (a synonym more common in England than in the United States). As it is impossible to introduce much stuffing into some pieces of meat even if the meat is cut to make a pocket for it, it is often well to prepare more than can be put into the meat and to cook the remainder in the pan beside the meat. Some cooks cover the extra stuffing with buttered paper while it is cooking and baste it at intervals.

Some recipes for meat dishes of this character follow, and others will be found in cook books.

### MOCK DUCK

Mock duck is made by placing on a round steak a stuffing of bread crumb well seasoned with chopped onions, butter, chopped suet or dripping, salt, pepper, and a little sage, if the flavor is relished. The steak is then rolled around the stuffing and tied with a string in several places. If the steak seems tough, the roll is steamed or stewed until tender before roasting in the oven until brown. Or it may be cooked in a casserole or other covered dish, in which case a cupful or more of water or soup stock should be poured around the meat. Mock duck is excellent served with currant or other acid jelly.



## MOCK WILD DUCK

1 flank steak, or	1 tablespoonful minced onion.
1½ pounds round steak cut ½ inch thick.	Salt, pepper, and powdered thyme, sage, and savory.
2 lamb kidneys.	2 tablespoonfuls flour.
¼ cup butter or drippings.	1 tablespoonful sugar.
½ cup cracker crumbs.	3 cupfuls water or stock.

Trim the kidneys of all fat, cords, and veins. Cut into small pieces and spread evenly over one side of the steak together with the crumbs, onion, and seasonings. Roll and tie with a cord. Brown the roll in fat, then remove and make a gravy by heating the flour in the fat and adding 3 cupfuls of stock or water and the sugar. Put the meat into the gravy and cook slowly, until tender, in a covered baking dish, a steamer, or a fireless cooker. If steamed or cooked in a fireless cooker, the roll should be browned in the oven before serving.

## VEAL OR BEEF BIRDS

A popular dish known as veal or beef birds or by a variety of special names is made by taking small pieces of meat, each just large enough for an individual serving, and preparing them in the same way as the mock duck is prepared.

Sometimes variety is introduced by seasoning the stuffing with chopped olives or tomato. Many cooks prepare their "birds" by browning in a little fat, then adding a little water, covering closely and simmering until tender.

## Utilizing the Cheaper Cuts of Meat in Palatable Dishes

When the housekeeper attempts to reduce her meat bill by using the less expensive cuts, she commonly has two difficulties to contend with—toughness and lack of flavor. It has been shown how prolonged cooking softens the connective tissues of the meat. Pounding the meat and chopping it are also employed with tough cuts, as they help to break the muscle fibers. As for flavor, the natural flavor of meat even in the least desirable cuts may be developed by careful



cooking, notably by browning the surface, and other flavors may be given by the addition of vegetables, and by seasoning with condiments of various kinds.

Methods of preparing inexpensive meat dishes will be discussed and practical directions for them will be given in the following sections. As often happens, two or three methods may be illustrated by the same dish, but the attempt has been made to group the recipes according to their most salient feature.

### Prolonged Cooking at Low Heat

Meat may be cooked in water in a number of ways without being allowed to reach the boiling point. With the ordinary kitchen range this is accomplished by cooking on the cooler part of the stove rather than on the hottest part, directly over the fire. Experience with a gas stove, particularly if it has a small burner known as a "simmerer," usually enables the cook to maintain temperatures which are high enough to sterilize the meat if it has become accidentally contaminated in any way and to make it tender without hardening the fibers. The double boiler would seem to be a neglected utensil for this purpose. Its contents can easily be kept up to a temperature of 200° F., and nothing will burn. Another method is by means of the fireless cooker. In this a high temperature can be maintained for a long time without the application of fresh heat. Still another method is by means of a closely-covered baking dish. Earthenware dishes of this kind suitable for serving foods as well as for cooking are known as casseroles. For cooking purposes a baking dish covered with a plate, or a bean jar covered with a saucer, may be substituted. The Aladdin oven has long been popular for the purpose of preserving temperatures

which are near the boiling point and yet do not reach it. It is a thoroughly insulated oven which may be heated either by a kerosene lamp or a gas jet.

In this connection directions are given for using some of the toughest and least promising pieces of meat.

### STEWED SHIN OF BEEF

4 pounds of shin of beef.	1 small slice of carrot.
1 medium-sized onion.	$\frac{1}{2}$ tablespoonful of salt.
1 whole clove and a small bay leaf.	$\frac{1}{2}$ teaspoonful of pepper.
1 sprig of parsley.	2 quarts of boiling water.
$1\frac{1}{2}$ tablespoonfuls of flour.	$1\frac{1}{2}$ tablespoonfuls of butter or savory drippings.

Have the butcher cut the bone in several pieces. Put all the ingredients but the flour and butter into a stewpan and bring to a boil. Set the pan where the liquid will just simmer for 6 hours, or after boiling for 5 or 10 minutes, put all into the fireless cooker for 8 or 9 hours. With the butter, flour, and  $\frac{1}{2}$  cupful of the clear soup from which the fat has been removed, make a brown sauce. To this add the meat and the marrow removed from the bone. Heat and serve. The remainder of the liquid in which the meat has been cooked may be used for soup.

### BOILED BEEF WITH HORSE-RADISH SAUCE

Plain boiled beef may also be served with a horse-radish sauce for which a recipe is given elsewhere, and makes a palatable dish. A little chopped parsley sprinkled over the meat when served is considered an improvement by many persons. For the sake of variety the meat may be browned like pot roast before serving.

### SCOTCH BROTH

3 pounds mutton.	2 tablespoonfuls of minced
2 tablespoonfuls of pearl barley.	celery.
2 tablespoonfuls of minced onion.	2 tablespoonfuls of salt.
2 tablespoonfuls of minced turnip.	1 teaspoonful of pepper.
2 tablespoonfuls of minced carrot.	1 tablespoonful of minced parsley.
	3 quarts cold water.

Remove the fat and all the bones from the mutton, cut the meat into small pieces and put it into a stewpan with the water, chopped vegetables, barley, and all the seasoning excepting the parsley. It will be found convenient to tie the bones in a piece of thin white cloth before adding them to the other ingredients. Bring the stew to a boil, quickly skim it and allow it to simmer for 3 hours, thicken with the flour, and add the chopped parsley.

### STUFFED HEART

Wash the heart thoroughly inside and out, stuff with the following mixture, and sew up the opening: 1 cup broken bread dipped in fat and browned in the oven, 1 chopped onion, and salt and pepper to taste.

Cover the heart with water and simmer until tender or boil 10 minutes and set in the fireless cooker for 6 or 8 hours. Remove from the water about  $\frac{1}{2}$  hour before serving. Dredge with flour, pepper, and salt, or sprinkle with crumbs and bake until brown.

### BRAISED BEEF, POT ROAST, AND BEEF À LA MODE

The above names are given to dishes made from the less tender cuts of meat. They vary little either in composition or method of preparation. In all cases the meat is browned on the outside to increase the flavor, and then cooked in a small amount of water in a closely-covered kettle or other receptacle until tender. The flavor of the dish is secured by browning the meat and by the addition of the seasoning vegetables. Many recipes suggest that the vegetables be removed before serving and the liquid be thickened. As the vegetables are usually extremely well-seasoned by means of the browned fat and the extracts of the meat, it seems a pity not to serve them.

Of course, the kind, quality, and shape of the meat all play their part in the matter. Extra time is needed for meats with a good deal of sinew and tough fibers, such as the tough steaks, shank cuts, etc.; and naturally a fillet of beef, or a steak from a prime cut, will take less time than a thick piece from the shin. Such dishes require more time and perhaps more skill in their preparation and may involve more expense for fuel than the more costly cuts, which like chops or tender steaks may be quickly cooked, but to the epicure, as well as to the average man, they are palatable when rightly prepared.



## BEAN-POT ROAST

3 pounds mutton (shoulder), or	1 cup potatoes cut into small
3 pounds round, or chuck steak.	pieces.
1 cup carrots cut into small	$\frac{1}{4}$ cup sliced onion.
pieces.	

Cover the meat with boiling water. Place the cover on the bean pot and let the meat cook in a moderate oven for 2 hours; then add the vegetables cut in  $\frac{1}{2}$ -inch cubes, with 2 teaspoonfuls salt; cook until the vegetables are tender, which will require about 1 hour; then serve, pouring a sauce over the meat, made from 1 cup of the liquid in which the meat was cooked, thickened with 2 tablespoonfuls of flour.

## [ HUNGARIAN GOULASH

2 pounds top round of beef.	1 onion.
A little flour.	2 bay leaves.
2 ounces salt pork.	6 whole cloves.
2 cups tomatoes.	6 peppercorns.
1 stalk celery.	1 blade mace.

Cut the beef into 2-inch pieces and sprinkle with flour; fry the salt pork until light brown; add the beef and cook slowly for about 35 minutes, stirring occasionally. Cover with water and simmer about 2 hours; season with salt and pepper or paprika.

From the vegetables and spices a sauce is made as follows: Cook in sufficient water to cover for 20 minutes; then rub through a sieve, and add to some of the stock in which the meat was cooked. Thicken with flour, using 2 tablespoonfuls (moistened with cold water) to each cup of liquid, and season with salt and paprika.

Serve the meat on a platter with the sauce poured over it. Potatoes, carrots, and green peppers cooked until tender, and cut into small pieces or narrow strips, are usually sprinkled over the dish when served, and noodles may be arranged in a border upon the platter.

Goulash is a Hungarian dish which has come to be a favorite in the United States.



## Casserole Cookery

A casserole is a heavy earthenware dish with a cover. A substitute for it can easily be improvised by using any heavy earthenware dish with a heavy plate for the cover. A casserole presentable enough in appearance to be put on the table serves the double purpose of baking and serving dish.

A suitable cut of beef or veal, and it may well be one of the cheaper cuts, as the long, slow cooking insures tenderness, may be cooked in a casserole.

Poultry and other meats besides beef or veal can be cooked in this manner. Chicken cooked in a casserole, which is a favorite and expensive dish in good hotels and restaurants, may be easily prepared in the home, and casserole cookery is to be recommended for a tough chicken.

The heat must be moderate and the cooking must occupy a long time. Hurried cooking in a casserole is out of the question. If care is taken in this particular, and suitable seasonings are used, few who know anything of cooking should go astray.

Chopped meat may also be cooked in a casserole, and this utensil is particularly useful for the purpose, because the food is served in the same dish in which it is cooked and may easily be kept hot, a point which is important with chopped meats, which usually cool rapidly.

## CASSEROLE ROAST

3 or 4 pounds of round or rump of beef.       $\frac{1}{2}$  each of a carrot, a turnip, an onion, and a head of

A slice of salt pork.                      celery cut into small pieces.

A few peppercorns.

Try out the pork. Brown the meat on both sides in the fat. Put in a casserole with the vegetables around it, add 2 cupfuls of water or stock. Cover and cook in a hot oven 3 hours, basting occasionally. A sauce or gravy can be made with water, flour, and some of the juice left in the casserole.

## CASSEROLE OR ITALIAN HASH

Boil  $\frac{1}{4}$  pound of macaroni, drain and put into a buttered casserole, add a little butter and grated cheese. Push the macaroni to the sides of the dish and fill the center with chopped

cooked meat seasoned to suit the taste of the family. A little sausage gives a good flavor to this dish. Place in the oven until hot throughout and serve.

A very good modification of this is made by using raw instead of cooked meat. For this  $\frac{1}{2}$  pound of round steak is sufficient for a family of six. This should be cut into small pieces, browned, and cooked until tender in water with the onions and other seasonings. An hour before the cooking is complete, add  $\frac{1}{2}$  can of tomatoes. Before serving, the meat may be mixed with the sauce, and the whole is poured over the macaroni.

### Meat Cooked with Vinegar

Dishes of similar sort as regards cooking, but in which vinegar is used to give flavor as well as to soften the meat and make it tender, are the following:

#### SOUR BEEF

Take a piece of beef from the rump or the lower round, cover with vinegar or with a half-and-half mixture of vinegar and water, add sliced onion, bay leaves, and a few mixed whole spices and salt. Allow to stand a week in winter or 3 or 4 days in summer; turn once a day and keep covered. When ready to cook, brown the meat in fat, using an enameled iron pan, strain the liquid over it and cook until tender; thicken the gravy with flour or ginger snaps (which may be broken up first), strain it, and pour over the sliced meat. Some cooks add cream.

#### SOUR BEEFSTEAK

Round steak may be cooked in water in which there is a little vinegar, or if the time is sufficient, it may be soaked for a few hours in vinegar and water and then cooked in a casserole or in some similar way.

#### Pounded Meat

Pounding meat before cooking is an old-fashioned method of making it tender, but while it has the advantage of breaking down the tough tissues it has the disadvantage of being likely to drive out the juices

and with them the flavor. A very good way of escaping this difficulty is pounding flour into the meat; this catches and retains the juices. Below are given the recipes for two palatable dishes in which this is done:

### FARMER STEW

Pound flour into both sides of a round steak, using as much as the meat will take up. This may be done with a meat pounder or with the edge of a heavy plate. Fry in drippings, butter, or other fat in a Scotch bowl, or if more convenient in an ordinary iron kettle or a frying pan; then add water enough to cover it. Cover the dish very tightly so that the steam can not escape and allow the meat to simmer for 2 hours or until it is tender. One advantage of this dish is that ordinarily it is ready to serve when the meat is done as the gravy is already thickened. However, if a large amount of fat is used in the frying, the gravy may not be thick enough and must be blended with flour.

### SPANISH BEEFSTEAK

Take a piece of round steak weighing 2 pounds and about an inch thick; pound until thin, season with salt and Cayenne pepper, cover with a layer of bacon or salt pork, cut into thin slices, roll and tie with a cord. Pour around it  $\frac{1}{2}$  cupful of milk and  $\frac{1}{2}$  cupful of water. Place in a covered baking dish and cook 2 hours, basting occasionally.

### Chopped Meat

Chopping meat is one of the principal methods of making tough and inexpensive meat tender, i.e., dividing it finely and thus cutting the connective tissue into small bits. Such meats have another advantage in that they may be cooked quickly and economically.

In broiling chopped meat the fact should be kept in mind that there is no reason why it should not be cooked like the best and most expensive tenderloin. The only reason that ever existed for difference in treatment was the toughness of the connective tissue, and this feature has been overcome by the chopping.



The ideal to be reached in broiling steak is to sear the surface very quickly, so that the juices which contain the greater part of the flavoring of the meat shall be kept in, and then to allow the heat to penetrate to the inside until the whole mass is cooked to the taste of the family. To pass the point where the meat ceases to be puffy and juicy and becomes flat and hard is very undesirable, as the palatability is then lost. Exactly the same ideal should be kept in mind in broiling chopped meat. If this were always done, hard, compact, tasteless balls or cakes of meat would be served less often. To begin with, the broiler should be even more carefully greased than for a whole steak. This makes it possible to form the balls or cakes of chopped meat with very little pressure without running the risk of having them pulled to pieces by adhering to the wires of the broiler. They should be heated on both sides even more quickly than the steak, because the chopping has provided more ways of escape for the juice, and these openings should be sealed as soon as possible. The interior should be cooked to the taste of the family just as the steak is.

In regard to broiling, it may incidentally be noted that housekeepers often make themselves unnecessary work when broiling under gas, by allowing the juice from steaks or meat balls to drop into the large pan under the rack. A smaller pan set in the larger one may be made to catch all the juice and fat and is much easier to wash. It serves also to economize the gravy.

Chopped raw meat of almost any kind can be very quickly made into a savory dish by cooking it with water or with water and milk for a short time, then thickening with butter and flour, and adding different seasonings as relished, either pepper and salt alone, or onion juice, celery, or tomato. Such a dish may be made to "go further" by serving it on toast or with a border of rice or in some similar combination.

### TOUGH PORTIONS OF PORTERHOUSE STEAK

Before speaking of the cooking of the cuts that lack tenderness throughout, it may be well to refer to the fact that the flank end of the porterhouse is to be classed with the toughest of cuts and with those which, when cooked alone, are with difficulty made tender even by long heating. Mock duck, which is commonly made out of flank steak, can be rendered tender



enough to be palatable only by long steaming or cooking in water, and yet people quite generally broil this part of the steak with the tenderloin and expect it to be eaten. The fact is that to broil this part of the porterhouse steak is not good management. It is much more profitable to put it into the soup kettle or to make it into a stew. In families where most of the members are away during the day the latter is a good plan, for the end of a steak makes a good stew for two or three people. This may be seasoned with vegetables left from dinner, or 2 or 3 olives cut up in gravy will give a very good flavor; or a few drops of some one of the bottled meat sauces, if the flavor is relished, or a little Chili sauce may be added to the stew. But if the tough end of a porterhouse is needed with the rest, a good plan is to put it through a meat grinder, make it into balls, and broil it with the tender portions. Each member of the family can then be served with a piece of the tenderloin and a meat ball. If the chopped meat is seasoned with a little onion juice, grated lemon rind, or chopped parsley, a good flavor is imparted to the gravy.

### HAMBURG STEAK

This name is commonly given to inexpensive cuts of beef chopped, seasoned a little, shaped into small balls or into one large thin cake, and quickly broiled in the way that a tender steak would be. Owing to the quick cooking, much of the natural flavor of the meat is developed and retained. The fact should be kept in mind that Hamburg steak must be made from fresh, well-ground meat. It is much safer to chop the meat at home, as chopped meat spoils very quickly. Much depends, too, upon browning it sufficiently to bring out the flavors. Many cooks think that Hamburg steak is improved if the meat is mixed with milk before it is cooked.

In some parts of the country, and particularly in some of the Southern States, two kinds of beef are on sale. One is imported from other parts of the country and is of higher price. The other, known locally as "native beef," is sometimes lacking in flavor and in fat and is usually tougher. Southern native beef such as is raised in Florida is almost invariably, however, of extremely good flavor, due presumably to the feed or other conditions under which it is raised. By chopping such meat and

cooking it as Hamburg steak, a dish almost as palatable as the best cuts of the more expensive beef may be obtained. In such cases, however, it is desirable because of the low percentage of fat to add suet or butter to the meat. The reason for this is that in the cooking, the water of the juice, when unprotected by fat, evaporates too quickly and leaves the meat dry. This may be prevented by adding egg as well as fat, for the albumen of the egg hardens quickly and tends to keep in the juices. The proportion should be 1 egg to  $1\frac{1}{2}$  pounds of meat.

### SAVORY ROLLS

Savory rolls in great variety are made out of chopped meat either with or without egg. The variety is secured by the flavoring materials used and by the sauces with which the baked rolls are served. A few recipes will be given below. While these definite directions are given it should be remembered that a few general principles borne in mind make recipes unnecessary and make it possible to utilize whatever may happen to be on hand. Appetizing rolls are made with beef and pork mixed. The proportion varies from 2 parts of beef and 1 of pork to 2 of pork and 1 of beef. The rolls are always improved by laying thin slices of salt pork or bacon over them, as these keep the surface moistened with fat during the roasting. These slices should be scored on the edge, so that they will not curl up in cooking. The necessity for the salt pork is greater when the chopped meat is chiefly beef than when it is largely pork or veal. Bread crumbs or bread moistened in water can always be added, as it helps to make the dish go farther. When onions, green peppers, or other vegetables are used, they should always be thoroughly cooked in fat before being put in the roll, for usually they do not cook sufficiently in the length of time it takes to cook the meat. Sausage makes a good addition to the roll, but it is usually cheaper to use unseasoned pork meat with the addition of a little sage.

### CANNELON OF BEEF

This dish is prepared by making chopped beef into a roll and baking it wrapped in a buttered paper, a method designed to keep in the steam and so insure a moist, tender dish. The paper must be removed before serving. The roll should be basted

occasionally with butter and water or drippings and water. In preparing the roll, an egg may be added for each pound and a half of meat, and chopped parsley, onion juice, lemon peel, or finely chopped green pepper will make a good seasoning. A thickened gravy may be made from the drippings, the liquid used being either water or tomato juice.

Strips of pork laid on the roll may be substituted for the buttered paper and basting.

### FILIPINO BEEF

1 pound round beef.	1 egg.
$\frac{1}{2}$ pound lean fresh pork.	2 cups of stewed tomatoes.
1 small onion.	2 slices of bacon.
1 green pepper.	2 tablespoonfuls of butter.
1 teaspoonful of salt.	4 tablespoonfuls of flour.
1 cup of soft stale bread crumbs.	

Remove the seeds from the pepper, and put it through the meat grinder with the meats and the onion. Add crumbs, egg, and salt. Make into a roll, place in a shallow baking dish, pour the strained tomatoes around it, put the bacon on top, and bake 40 minutes, basting with the tomatoes. Thicken the gravy with the flour cooked in the butter. A little seasoning such as a bit of bay leaf, a clove, and a small piece of onion improves the tomato sauce. As the pepper and onion are not likely to be cooked as soon as the meat, it is well to fry them in a little fat before adding to the other ingredients.

This dish will serve 6 to 8 people. When the meat is 20 cents a pound and every other item is valued at usual town market prices, the dish costs about 50 cents. If the meat costs only 10 cents per pound and vegetables from the garden are used, the initial cost of the dish will be small. Since no vegetable except potatoes or rice need be served with this dish, it may be said to answer the purpose of both meat and vegetable.

### MOCK RABBIT

{ $\frac{1}{2}$ pound round steak, and	3 slices of bread moistened
{ 1 pound sausage;	with water.
or	1 egg.
{ 1 pound round steak, and	1 onion.
{ $\frac{1}{2}$ pound sausage meat.	$\frac{1}{4}$ pound salt pork.
	Pepper and salt.



Chop the meat. Chop the onion and cook (but do not brown) it in the fat tried out of a small portion of the pork. Add the bread and cook a few minutes. When this is cool, mix all the ingredients and form into a long round roll. The surface can easily be made smooth if the hand is wet with cold water. Lay the remaining pork, cut in thin slices, on top; and bake 40 minutes in a hot oven. The sausage may be omitted if desired and other seasoning used.

### VEAL LOAF

3 pounds veal.	3 eggs well beaten.
1 pound salt pork.	$\frac{1}{4}$ teaspoonful pepper.
6 soda crackers rolled fine.	$\frac{1}{2}$ teaspoonful salt.

Chop the meat mixed with the other ingredients, shape, and bake 3 hours, basting occasionally with pork fat. Use  $\frac{1}{4}$  cup of fat for this purpose. If the roll is pierced occasionally, the fat will penetrate more effectually. Veal loaf may also be cooked in bread pans. Some persons cook the veal before chopping.

### Developing and Improving Flavor of Meat

The typical meat flavors are very palatable to most persons, even when they are constantly tasted, and consequently the better cuts of meat in which they are well developed can be cooked and served without attention being paid especially to flavor. Careful cooking aids in developing the natural flavor of some of the cheaper cuts, and such a result is to be sought wherever it is possible. Browning also brings out flavors agreeable to most palates. Aside from these two ways of increasing the flavor of the meat itself, there are countless ways of adding flavor to otherwise rather tasteless meats. The flavors may be added in preparing the meat for cooking, as in various seasoned dishes already described, or they may be supplied to cooked meat in the form of sauces.



### Retaining Natural Flavor

As has already been pointed out, it is extremely difficult to retain the flavor-giving extractives in a piece of meat so tough as to require prolonged cooking. It is sometimes partially accomplished by first searing the exterior of the meat and thus preventing the escape of the juices. Another device, illustrated by the following recipe, is to let them escape into the gravy which is served with the meat itself. A similar principle is applied when roasts are basted with their own juice.

### ROUND STEAK ON BISCUITS

Cut round steak into pieces about  $\frac{1}{2}$  inch square, cover with water and cook at a temperature just below the boiling point until tender, or boil for 5 minutes, and while still hot put into the fireless cooker and leave for 5 hours. Thicken the gravy with flour mixed with water, allowing 2 level table spoonfuls to a cup of water. Pour the meat and gravy over split baking-powder biscuits so baked that they have a large amount of crust.

### Flavor of Browned Meat or Fat

Next to the unchanged flavor of the meat itself comes the flavor which is secured by browning the meat with fat. The outside slices of roast meat have this browned flavor in marked degree. Except in the case of roasts, browning for flavor is usually accomplished by heating the meat in a frying pan in fat which has been tried out of pork, or in suet or butter. Care should be taken that the fat is not scorched. The chief reason for the bad opinion in which fried food is held by many is that it almost always means eating burned fat. When fat is heated too high it splits up into fatty acids and glycerin, and from the glycerin is formed a substance

(acrolein) which has a very irritating effect upon the mucous membrane. All will recall that the fumes of scorched fat make the eyes water. It is not surprising that such a substance, if taken into the stomach, should cause digestive disturbance. Fat in itself is a very valuable food, and the objection to fried foods because they may be fat seems illogical. If they supply burned fat there is a good reason for suspicion. Many housekeepers cook bacon in the oven on a wire broiler over a pan, and believe it more wholesome than fried bacon. The reason, of course, is that thus cooked in the oven, there is less chance of the bacon becoming impregnated with burned fat. Where fried salt pork is much used good cooks know that it must not be cooked over a very hot fire, even if they have never heard of the chemistry of burned fat. The recipe for bean-pot roast and other similar recipes may be varied by browning the meat, or part of it, before covering with water. This results in keeping some of the natural flavoring within the meat itself and allowing less to go into the gravy. The flavor of veal can be very greatly improved in this way.

The following old-fashioned dishes made with pork, owe their savoriness chiefly to the flavor of browned fat or meat:

#### SALT PORK WITH MILK GRAVY

Cut salt or cured pork into thin slices. If very salt, cover with hot water and allow it to stand for 10 minutes. Score the rind of the slices and fry slowly until they are a golden brown. Make a milk gravy by heating flour in the fat that has been tried out, allowing 2 tablespoonfuls of fat and 2 tablespoonfuls of flour to each cup of milk. This is a good way to use skim milk, which is as rich in protein as whole milk. The pork and milk gravy, served with boiled or baked potatoes, makes a cheap

and simple meal, but one that most people like very much. Bacon is often used in place of salt pork in making this dish.

### FRIED SALT PORK WITH SALT CODFISH OR "SALT FISH DINNER"

$\frac{1}{2}$ pound salt pork.	4 tablespoonfuls flour.
1 pound codfish.	A speck of salt.
2 cups of milk (skim milk will do).	

Cut the codfish into strips, soak in lukewarm water and then cook in water until tender; but do not allow the water to come to the boiling point except for a very short time, as prolonged boiling may make it tough. Cut the pork into  $\frac{1}{4}$ -inch slices and cut several gashes in each piece. Fry very slowly until golden brown, and remove, pouring off the fat. Out of 4 tablespoonfuls of the fat, the flour, and the milk make a white sauce. Dish up the codfish with pieces of pork around it and serve with boiled potatoes and beets. Some persons serve the pork, and the fat from it, in a gravy boat so it can be added as relished.

### Flavoring Vegetables, Herbs, Spices, Etc.

Many flavorings are used in meat dishes, some of which are familiar to all cooks—onions, carrots, turnips, and garlic being perhaps the most widely known. Butter, too, may be regarded as one of the most common seasonings, and of course makes the dish richer. Meat extract is also used for flavoring many meat dishes and other foods, as are also, though less commonly, similar extracts made from clams or other "sea food." The following list includes these with various others, a number of which it is convenient to keep always on hand: Onions, carrots, green peppers, parsnips, turnips, tomatoes, fresh canned or dried; celery tops and parsley, either fresh or dried; sage, savory, thyme, sweet marjoram, bay leaf, garlic, lemon rind, vinegar, capers, pickles, olives, currant jelly, curry



powder, cloves, pepper corns, celery seed, meat extract, Chili sauce, pepper sauce, or some similar hot or sharp sauce, and some kind of good commercial meat sauce. Some hints regarding the use of such flavorings follow:

*Flavor of fried vegetables.* Most of the stews, soups, braised meats, and pot roasts are very much improved if the flavoring vegetables which they contain, such as carrots, turnips, onions, celery, or green peppers, are fried in a little fat before being cooked with the meat. This need not complicate the preparation of the meat or increase the number of utensils used, for the meat itself is usually seared over in fat, and the vegetables can be cooked in the same fat before the browning of the meat.

*Onion juice.* Cookbooks usually say that onion juice should be extracted by cutting an onion in two and rubbing the cut surface against a grater. Considering how hard it is to wash a grater, this method has its drawbacks. Small amounts of juice may be obtained in the following simpler way: Peel the onion and extract a few drops of juice by pressing one side with the dull edge of a knife.

*Green peppers.* The flavor of green peppers gives an acceptable variety. The seed should always be removed. The peppers should be chopped and added to chopped meat or other meat dishes. Meat mixed with bread crumbs may be baked in the pepper shells, and the stuffed peppers served as a separate dish.

*Parsley.* It is easy to raise parsley by growing it in a pot in the kitchen window and thus to have it always on hand fresh, or the leaves may be kept for a long time if sealed up in a fruit jar and stored in a cool place. Parsley, mint, and celery tops may all be dried, rubbed into fine bits, and kept in air-tight jars. Recipes usually say to chop fresh parsley with a sharp knife on a board. But a board is a hard thing to wash, and a plate serves the purpose quite as well.

*Bay leaf.* Bay leaf is one of the best and at the same time one of the most-abused flavors. In small quantities it gives a very pleasant flavor to soups and gravies, but in large quantities it gives a rank resin-like taste. Remember that half of a bay leaf is the allowance for 3 quarts of soup stock. This will indicate



how small a quantity should be used for the portion of gravy usually served at a meal. With this precaution in mind, bay leaf may be recommended as a flavoring for many sauces, particularly tomato sauce.

*A kitchen bouquet.* A "bouquet" such as is often referred to in recipes may be made as follows: A sprig each of parsley, savory, and thyme, one small leaf of sage, and a bay leaf. This will flavor 1 gallon of soup when cooked in it for an hour, and should not remain in it longer.

*Horse-radish.* Horse-radish, like mustard, is more often served with meat than used to flavor it during cooking. A very palatable sauce, especially good with boiled beef, is made by adding grated horse-radish and a little vinegar to a little whipped cream, or as follows: Thicken milk with cracker crumbs by heating them together in a double boiler, using 3 tablespoonfuls of cracker crumbs to  $1\frac{1}{2}$  cups of milk. Add  $\frac{1}{3}$  of a cup of grated horse-radish, 3 tablespoonfuls of butter, and  $\frac{1}{2}$  teaspoonful of salt; or thicken with butter and flour some of the water in which the meat was boiled, add a generous quantity (1 or 2 tablespoonfuls) of grated horse-radish, boil a short time, and serve. This recipe is most usual in German homes, where the sauce is a favorite.

*Acid flavoring.* Vinegar, lemon juice, and sour jelly, like currant, are often used to flavor the thick gravies which are a part of meat stew or which are served with it. Vinegar is an old-fashioned relish which was often added to bacon or salt pork and greens, pork and beans, corned beef and cabbage, and similar dishes. These flavors combine well with that of brown flour, but not with onions or other vegetables of strong flavor. The idea that vinegar used in small quantities is unwholesome seems to be without foundation.

*Pickles.* Chopped pickles are sometimes added to the gravy served with boiled mutton. They are cheaper than capers and serve somewhat the same purpose. Chopped pickles are also very commonly used in sauces for fish, and in many others, to give a distinctive flavor.

*Olives.* Chopped olives also make a welcome variety in meat sauce, and are not expensive if they are bought in bulk. They will not spoil if a little olive oil is poured on the top of the liquor in which they are kept. This liquor should always completely cover them.

*Chili sauce, commercial meat sauces, etc.* Recipes often may be varied by the addition of a little Chili sauce, tomato catsup, or a commercial meat sauce. These may be called emergency flavors and used when it is not convenient to prepare other kinds of gravies.

*Sausage.* A little sausage or chopped ham may be used in chopped beef.

*Curry powder.* This mixture of spices which apparently originated in India, but which is now a common commercial product everywhere, is a favorite flavoring for veal, lamb, or poultry. The precaution mentioned in connection with bay leaves, however, should be observed. A small amount gives a good flavor. It is usually used to season the thick sauces with which meats are served or in which they are allowed to simmer. While the term "curry" is usually employed to describe a particular mixture of spices made up for the trade, it has another meaning. The words "curry" or "curried" are sometimes used to describe highly seasoned dishes of meat, eggs, or vegetables prepared by methods that have come from India or other parts of the East.

### INDIA CURRY

1½ pounds veal.	2 onions or less.
½ cup of butter or drippings.	½ tablespoonful curry or less.

Brown the meat either without fat or with very little, and cut into small pieces.

Fry the onions in the butter, remove them, add the meat and curry powder. Cover the meat with boiling water and cook until tender. Serve with border of rice. This dish is so savory that it can be made to go a long way by serving with a large amount of rice. The 2 onions and ½ tablespoonful of curry powder are the largest amounts to be used. Many persons prefer less of each.

In preparing the rice for this dish, perhaps no better method can be given than that in an earlier bulletin of this series.<sup>1</sup>

"Wash 1 cupful of rice in several waters, rubbing the grains between the hands to remove all the dirt. Put the washed rice in a stewpan with 2½ cupfuls of water and 1 teaspoonful of salt. Cover and place where the water will boil. Cook for 20 minutes,

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 256, p. 38.

being careful not to let it burn. At the end of this time put the stewpan on a tripod or ring, and cover the rice with a fold of cheese-cloth. Let it continue to cook in this manner an hour, then turn into a hot vegetable dish. The rice will be tender, dry and sweet, and each grain will be separate. During the whole process of cooking, the rice must not be stirred. If a tablespoonful of butter is cut up and scattered over the rice when it has cooked 20 minutes, the dish will be very much improved."

The butter is not necessary when the rice is served with India curry but may be included in dishes where less fat is used.

### CURRY OF VEAL

2 tablespoonfuls butter or drippings.	1 pint milk.
1½ pounds veal.	1 tablespoonful flour.
½ onion, chopped.	1 teaspoonful curry powder.
	Salt and pepper.

Fry the onions in the butter or drippings, remove, and fry the veal until it is brown. Transfer the meat to the double boiler, cover with milk and cook until the meat is tender. Add the curry powder a short time before the meat is done, and thicken the milk with flour before serving.

### Sauces

The art of preparing savory gravies and sauces is more important in connection with the serving of the cheaper meats than in connection with the cooking of the more expensive.

There are a few general principles underlying the making of all sauces or gravies, whether the liquid used is water, milk, stock, tomato juice, or some combination of these. For ordinary gravy 2 level tablespoonfuls of flour, or 1½ tablespoonfuls of cornstarch or arrowroot, is sufficient to thicken a cupful of liquid. This is true excepting when, as in certain recipes described, the flour is browned. In this case about ½ tablespoonful more should be allowed, for browned flour does



not thicken so well as unbrowned. The fat used may be butter or the drippings from the meat, the allowance being 2 tablespoonfuls to a cup of liquid.

The easiest way to mix the ingredients is to heat the fat, add the flour, and cook until the mixture ceases to bubble, and then to add the liquid. This is a quick method, and by using it there is little danger of getting a lumpy gravy. Many persons, however, think it is not a wholesome method and prefer the old-fashioned one of thickening the gravy by means of flour mixed with a little cold water. The latter method is of course not practicable for brown gravies.

Considering the large amount of discussion about the digestibility of fried food and of gravies made by heating flour in fat, a few words on the subject at this point may not be out of order. It is difficult to see how heating the fat before adding the flour can be unwholesome, unless the cook is unskillful enough to heat the fat so high that it begins to scorch. Overheated fat, as has already been pointed out, contains an acrid irritating substance called "acrolein," which may be wisely considered unwholesome. It is without doubt the production of this body, by overheating, which has given fried food its bad name. Several ways of varying the flavor of gravies and sauces were suggested in the preceding section. One other should be especially mentioned here.

*The flavor of browned flour.* The good flavor of browned flour is often overlooked. If flour is cooked in fat until it is a dark brown color, a distinctive and very agreeable flavor is obtained. This flavor combines very well with that of currant jelly, and a little jelly added to a brown gravy is a great improvement. The flavor of this should not be combined with that of onions or other highly flavored vegetables. A recipe for a dish which is made with brown sauce follows:



MOCK VENISON

Cut cold mutton into thin slices and heat in a brown sauce made according to the following proportions:

2 tablespoonfuls butter.	1 tablespoonful red-currant
2 tablespoonfuls flour.	jelly.
1 tablespoonful of bottled meat	1 cupful water or stock.
sauce (whichever is preferred.)	

Brown the flour in the butter, add the water or stock slowly, and keep stirring. Then add the jelly and meat sauce and let the mixture boil up well.

U. S. DEPARTMENT OF AGRICULTURE  
FARMERS' BULLETIN NO. 565

---

CORN MEAL AS A FOOD AND WAYS OF  
USING IT

C. F. LANGWORTHY

Chief

and

CAROLINE L. HUNT

Scientific Assistant, Office of Home Economics

---

*Contribution from the States Relations Service*

A. C. TRUE, Director

---

INTRODUCTION

Corn Meal long has been an important food material in this country. Its use in the diet should be increased. How to use it to the best advantage calls for some knowledge of its nature, properties, and food value, and also some understanding of the possibilities of its use as compared with other foods which make up the ordinary diet.

If the meals of the ordinary family are analyzed, each will be found to contain one or more foods from each of the following groups:

(1) Fruits and vegetables. Without these there is danger that the diet may be lacking in mineral matter and other substances needed in the making of tissues and the keeping of the body in health.

(2) Milk, cheese, eggs, meat, fish, and dried legumes (peas, beans, etc.). Without these there is danger that the diet may be lacking in protein, an indispensable tissue builder.

(3) Cereals (wheat, oats, rye, corn, barley, and rice) and their products. Without these the diet would contain practically no starch, the cheapest kind of body fuel. Without them the protein would be too low, unless the foods listed under (2) are used more freely than is desirable for economy or health.

(4) Sugar, molasses, sirups, honey, and other sweets. Without these the diet would be lacking in sugar, valued as body fuel and for its flavor.

(5) Fats (butter, lard, meat fat, and olive, peanut, cotton seed, and other fats and oils). Without such fats, which have a high value as body fuel and give to food an agreeable quality commonly called "richness," the diet would be lacking in a needed component.

If all these groups are regularly represented in the diet and partaken of in rational amounts, it will contain all the substances needed for health. By thinking of the common food materials according to the groups to which they severally belong, the housekeeper will see that variety may be secured in either of two ways—by multiplying the representatives of the various groups in each meal (serving fish and meat in the same meal, for example, or white and sweet potatoes), or by limiting the representatives of each group and varying them from meal to meal. By the latter means variety

would be secured through a succession of simple meals differing among themselves.

The purpose of this bulletin is to discuss corn meal as a representative of one of the five groups of food materials, to show that it can be used in place of other foods of the same group in case of need or for the purpose of securing variety, and to indicate its relation to other foods that are needed in order to work out a simple and healthful diet.

Few people wish to remember the composition of foods exactly, but many, particularly housekeepers and others who are interested practically in the food supplies of families or other groups, wish to keep in mind in a general way the composition of the foods which they handle. For such people it will be sufficient to think of the composition of corn in terms of tenths: seven of the tenths being starch; one, protein; one, water; and the other tenth being about half fat and half crude fiber and mineral substances.

### **White and Yellow Corn and Corn of Other Colors**

As regards color, there are many varieties of corn—white, yellow, red, blue, and black. There is also some difference in the flavor of the different sorts, but, contrary to common belief, these varieties are, on the average, practically identical in composition, and differ little in nutritive value. White corn is, as a rule, milder in flavor than yellow. The preference for one sort or another, however, is a personal matter, and seems to be determined very largely by locality. White corn is preferred generally in the Southern States and in Rhode Island, and yellow in the Northern States as a whole, and the blue, black, and red always have been



used very largely in the Southwest, where Spanish influence is marked.

### Selection and Care

There are two general kinds of corn meal, the granular and the so-called "water ground." The former is more used in the North, the latter in the South. The granular meal is milled from kiln-dried degermed corn between rollers which may become quite hot during the process, and is bolted. It feels dry when rubbed between the fingers. It is convenient for use, for it keeps well and is suitable for making corn breads which contain baking powder or eggs, or in which the corn meal is combined with wheat. For some sorts of cooking it requires softening by scalding. The water-ground meal is prepared very generally from white dent corn which has been neither kiln-dried nor degermed. It is milled between stones which are not allowed to reach a high temperature, and may or may not be bolted. It is not so dry as the granular meal and feels softer or more flour-like to the touch. While it can be used for all sorts of corn cooking, it is particularly suitable for the simpler forms of bread, which consist chiefly of meal, shortening, and water or milk. When used in preparing such breads, however, it should not be ground too finely.

Since corn meal spoils rather easily, special attention should be given to the way in which it is stored. It should be kept in a cool, dry place and should be closely covered to exclude insects. This applies to the mill and the shop as well as the home. The "water-ground" meal spoils more easily than the granular meal. When convenient, therefore, it should be milled only in small quantities as needed.

### The Cooking of Corn Meal

Recipes for the use of corn meal that will be useful everywhere are not easy to make, for the meal used in various parts of the country differs considerably. The two best-known types of meal are those called "old process" and "new process," or "water ground" and "granular." In general the granular, which is used commonly in the North, requires more water and longer cooking than the water ground, which is used more generally in the South. This extra cooking is for the purpose of removing the quality, which has given to it the name "granular."

Careful study of the best methods of cooking both kinds of meal was made a few years ago at Teachers College, Columbia University, New York City, for the Office of Experiment Stations of the United States Department of Agriculture. The results of these investigations, which are still unpublished, may be summarized as follows:

In general, about 10 per cent more water is needed for the new process than for the old process meal. In some cases the meal is likely to sink where a larger quantity of water is used, and under these circumstances the mixture of meal and water should be heated thoroughly before being used in the preparation of such dishes as bread. In using the old-process meal it is sufficient to pour boiling water over the meal in a cold dish, but in using the new-process meal it is better to pour the meal into a dish of boiling water. In the latter case the dish itself is hot and the mixture reaches a higher temperature.

Later experiments showed that in some cases, notably that of making quick-process breads out of new-process

corn meal, it is not sufficient even to pour the meal into hot water, but a little cooking seems to be necessary.

The process of softening corn meal for use in making bread and other dishes, such as doughnuts and waffles, and the cooking of corn meal in water or milk for use as a mush, have so much in common that they will be discussed together.

In order to produce a satisfactory flavor it seems necessary that the mush should at some time reach the boiling point. The most common way of preparing mush is to allow the water to come to the boiling point and to add the meal slowly, stirring constantly. The objection to this method is that there is considerable danger that the mush will become lumpy, and often-times it is inconvenient and unpleasant to stand over a hot stove and stir the mixture sufficiently to make it smooth. A better method, therefore, is the following:

Put the corn meal, cold water, and salt together in the top of a double boiler. No stirring is necessary. Put the top of the double boiler into the lower part and allow the mush to heat slowly, cooking half an hour, or longer, if convenient. Many people cook it as long as four hours. Just before serving remove the top of the double boiler from the lower part and boil the mush for 2 or 3 minutes. In boiling it at this time there is no danger that it will lump.

This general method may be followed whenever corn meal is to be used in bread, doughnuts, or other dishes. In this case, however, the final boiling is not necessary, for the meal is sufficiently heated later.



### Corn-meal Bread

To make a good yeast bread out of corn meal alone is difficult, if not impossible. In order to understand the problems involved, it is necessary to know something about the protein, particularly how it differs from the protein of other cereals commonly used in the preparation of yeast bread. It should be remembered that the word "protein" is not used here to designate any one substance of unvarying characteristics, but is applied to many mixtures of nitrogenous substances which are found in almost every natural food product. It is possible, therefore, for the protein of two food materials, corn and wheat for example, to be similar in quantity, but to differ widely in quality.

The chief proteid of wheat, "gluten," is a mixture of substances which, when combined with water, make a peculiarly sticky and tenacious mass that tends to hold any gas which is introduced into it. Because of the presence of gluten, it is possible to make a porous loaf out of wheat and water.

The protein of corn, on the other hand, is wholly lacking in the quality of tenacity, and so the somewhat granular particles of meal tend to separate readily. Although this is an advantage in the preparation of some dishes, as stated above, it is a disadvantage in others, for any gas which is introduced into the moist meal escapes easily without rendering the mass porous. In fact, if eggs are not used with the meal, a certain amount of flour must be introduced if the bread is to be light and porous. The early settlers of this country discovered that adding rye to the corn helps to keep the bread moist and holds the gas bubbles made by the yeast.



In a general way, corn-meal breads, though of very great variety, fall into three classes: Those raised by air beaten into them, those raised by baking powder or soda, and those raised by yeast. The granular character of the meal favors the making of the first kind, for, as we have seen, there is nothing corresponding with the gluten of wheat to hold the particles together and to prevent them from being driven apart by the expansion of the air. Such breads are best made from the coarser meals and are usually very simple in character, often containing nothing more than meal, salt, and either water or milk. A small amount of fat, however, is added sometimes. Recent carefully conducted experiments have shown that these simple breads, which are tender and light, though solid in appearance, can be satisfactorily made out of finely ground meal, if a little baking powder is added. In the corn-meal breads of the second class, which are made light by the carbon dioxid given off by baking powder or through the action of sour milk on soda, the gluten deficiency of the corn is made up for by the use of eggs, which hold the air bubbles which make it light. In breads of the third class, those raised by the carbon dioxid given off by the yeast, the gluten deficiency in the corn is supplied by the addition of some other flour, usually wheat or rye. Yeast-raised corn breads do not dry out nearly so quickly as the other types, and they are palatable either warm or cold. For these reasons they are convenient for the housekeeper who does not wish to make bread fresh for each meal.

In the pages which follow, recipes are given for breads of each class. The simpler breads, like ash cake and hoecake, are very old types closely resembling the bread of primitive people, and such corn breads were made

by the Indians. Though easy to prepare, they are nevertheless very palatable.

### ASH CAKE

1 quart corn meal.	1 tablespoon lard or other shortening.
2 teaspoons salt.	Boiling water.

Scald the meal; add the salt and shortening, and when the mixture is cool, form into oblong cakes, adding more water if necessary. Wrap the cakes in cabbage leaves, or place 1 cabbage leaf under the cakes and 1 over them, and cover them with hot ashes.

### HOECAKE

Hoecakes are made of corn meal, water, and salt. Originally they were baked before an open fire on a board, which for convenience had a long handle attached to it. At present they are cooked slowly, and on both sides, on a well-greased griddle.

### CORN DODGER

The corn dodger is like the ash cake, except that it usually contains a small amount of butter or lard. The meal is scalded, and when cool is formed into cakes and cooked in a hot oven.

### CORN PONE

2 cups corn meal.	$\frac{1}{4}$ cup wheat flour.
$\frac{1}{3}$ cup water.	1 teaspoon salt.
$\frac{1}{3}$ cup sour milk or buttermilk.	1 tablespoon sugar.
$\frac{1}{4}$ teaspoon soda.	2 teaspoons baking powder.

Pour the water and milk over the corn meal in a double boiler and cook a few moments, or boil the water and pour it over the corn meal and then add the buttermilk. Sift together the flour, salt, sugar, baking powder, and soda, and add to the corn meal when it is cool. The mixture should be just stiff enough to make into cakes or "pones." If it is stiffer than this, add a little water. Form into cakes and place in a hot, well-greased pan and bake in a hot oven until brown. The cakes should be handled lightly and not pressed down after they have been placed in the pan.

## WHEAT-CORN YEAST BREAD

1½ cups milk, water, or a mixture of the two.	1 tablespoon sugar.
½ cake compressed yeast.	Fat (if used), 1 tablespoon.
1½ teaspoons salt.	1 cup corn meal.
	2 cups wheat flour.

Put 1½ cupfuls of the water, the corn meal, salt, sugar, and fat (if used) into a double boiler and cook 20 minutes. The water is sufficient only to soften the meal a little. Allow the meal to cool to about the temperature of the room and add the flour and yeast, mixed with the rest of the water. Knead thoroughly, make into a loaf, place in a pan of standard size, allow to rise until it nearly fills the pan, and bake 45 or 50 minutes.

It is hardly practicable to use a greater percentage of corn meal than this even in emergencies, for bread so made differs very little from baked mush. Less corn meal can be used, and in such a case the general method given above may be followed.

It is possible to make a yeast-raised corn bread without first cooking the corn meal. In this case not more than 1 cupful of meal should be used to 4 cupfuls of flour. In other respects the bread is mixed and baked as in the above recipe. Such bread has little noticeable corn-meal flavor. If a larger proportion of corn meal is used, the bread will seem dry.

The above recipe for wheat-corn yeast bread was worked out for use with granular corn meal, from the following recipe in common use in South Carolina with old-process meal.

## SOUTH CAROLINA YEAST CORN BREAD

1½ quarts fine corn meal.	1½ quarts wheat flour.
2½ quarts wheat flour.	2 teaspoons salt.
Or	1 pint mashed sweet potatoes.
2½ quarts fine corn meal.	1 cake yeast.

Mix 1 pint each of the corn meal and the flour and add warm water enough to form a stiff batter. Add the yeast cake, mixed with a small amount of water. Keep this sponge in a warm place until it becomes light. Scald the meal with boiling water, and as soon as it is cool enough add it to the sponge with the flour, potatoes, and salt. The dough should be just thick enough



to knead without danger of its sticking to the board. Experience will teach how much water to use to secure this end. Knead well and put in a warm place to rise. When it is light, form into loaves, put into bread pans, and let it rise until its volume is doubled. Bake in a moderate oven.

A common, though not general, practice in New England was to add cooked pumpkin to the other ingredients in making such bread as this, very much as sweet potato is used in the South. The sweet potato or pumpkin changes the flavor of the bread somewhat, and apparently facilitates the rising of the dough, improves the texture of the bread, and tends to keep it moist. However, if sweet potato or pumpkin, either home cooked or canned, can not be obtained conveniently, good bread can be made without it.

#### APPLE CORN BREAD (WITHOUT WHEAT)

2 cups white corn meal.	1 teaspoon cream of tartar.
2 tablespoons sugar.	1 $\frac{2}{3}$ cups milk.
$\frac{3}{4}$ teaspoon salt.	3 tart apples, pared and
1 teaspoon soda.	sliced.

Mix the dry ingredients, add the milk, and beat thoroughly. Add the apples. Pour into a well-buttered shallow pan, and bake 30 minutes or longer, in a hot oven, to soften the apples.

This could be made with dried apricots cooked, in the usual manner, by soaking and cooking slowly and adding a little sugar. The juice may be used as sauce.

This serves six or eight people.

#### CRACKLING BREAD (WITHOUT WHEAT)

1 quart corn meal.	3 teaspoons salt.
1 pint cracklings.	Boiling water.

Mix the corn meal and salt; pour over this mixture enough boiling water to moisten but not enough to make a mush. When the meal has cooled, work the cracklings into it with the fingers. Form the dough into cakes about 4 inches long, 2 inches wide, and 1 inch thick; bake for 30 minutes. This bread, because of its large percentage of fat, is eaten without butter, and should be served very hot.

"Cracklings," like "scraps," is a name given to the crisp, brown meat tissue left after lard is "tried out." They consist



of connective tissue with a large amount of fat adhering to it. Much of the fat can be removed by pressure. This is best done by squeezing them in a thin cloth while they are still warm or after they have been reheated.

Because of the large amount of fat in this bread, it is better food for persons who are working hard out of doors than for those of sedentary occupations. It makes 12 cakes.

### CRISP CORN-MEAL CAKE (WITHOUT WHEAT).

3 cups milk.	1½ cups corn meal.
1 teaspoon salt.	

Mix the ingredients and spread on shallow buttered pans to a depth of about  $\frac{1}{4}$  of an inch. Bake in a moderate oven until crisp.

This will serve six people.

### SOUR-MILK CORN BREAD (WITHOUT WHEAT).

2 cups corn meal.	1½ teaspoons salt.
2 cups sour milk.	2 eggs.
2 tablespoons butter.	1 teaspoon soda.
2 tablespoons sugar, white or brown.	1 tablespoon cold water.

There are two ways of mixing this bread. By the first the meal, milk, salt, butter, and sugar are cooked in a double boiler for about 10 minutes. When the mixture is cool, the eggs are added well beaten and the soda dissolved in the water. By the other method all the dry ingredients, including the soda, are mixed together, and then the sour milk and eggs, well beaten, and the butter are added. If the second method is followed, the cold water is not needed. The bread should be baked in a shallow iron or granite pan for about 30 minutes.

Since the bread made by the first method is of much better texture, that method is to be preferred, except in cases where there is not time for the necessary heating and cooling of the meal.

Buttermilk may be substituted for the sour milk, in which case the butter should be increased slightly; or sour cream may be used and the butter omitted.

This serves six people.

## SPIDER CORN BREAD (WITHOUT WHEAT)

1½ cups corn meal.	1 teaspoon salt.
2 cups sour milk.	2 eggs.
1 teaspoon soda.	2 tablespoons butter.

Mix the dry ingredients. Add the eggs well beaten and the milk. Place the butter in a frying pan, melt it, and grease the pan well. Heat the pan and turn in the mixture. Place in a hot oven and cook 20 minutes.

This serves six people.

## SWEET-MILK CORN BREAD

2 cups yellow corn meal.	1 teaspoon salt.
1 cup wheat flour.	2 eggs.
2 cups milk.	3 teaspoons baking powder.
½ cup sugar.	

Sift together the corn meal, flour, sugar, salt, and baking powder. Add the eggs well beaten and the milk, and bake ½ hour in a moderate oven.

In this case, as in the recipe for sour-milk corn bread, the corn meal can be cooked for a short time with the milk if a softer bread is desired.

This serves eight people.

## CORN-MEAL MUFFINS

½ cup corn meal.	1 tablespoon melted butter.
1 cup wheat flour.	1 teaspoon salt.
3 teaspoons baking powder.	¾ cup milk.
2 tablespoons sugar.	1 egg.

Mix and sift the dry ingredients; add the milk gradually, the egg well beaten, and the melted butter; bake in a hot oven in buttered gem pans 25 minutes.

This serves four people.

## CORN MUFFINS WITH DATES

1 cup white corn meal.	1 cup wheat flour.
2 tablespoons brown sugar.	4 teaspoons baking powder.
1 teaspoon salt.	1 egg.
2 tablespoons butter.	½ cup dates cut into small
1¼ cups milk.	pieces.

Cook together the first 5 ingredients for 10 minutes in a double boiler. When cool, add the eggs, the dates, and the flour sifted with the baking powder. Beat thoroughly and bake in muffin pans in a quick oven, or bake in a loaf. The bread will keep in good condition longer if the dates are cooked with the corn meal, and the other ingredients, in the double boiler.

Variety may be secured by cooking the dates thus.

This serves six people.

### CUSTARD CORN CAKE

2 eggs.	1 cup sweet milk.
$\frac{1}{4}$ cup sugar.	$1\frac{2}{3}$ cups corn meal.
1 teaspoon soda.	$\frac{1}{3}$ cup wheat flour.
1 teaspoon salt.	2 tablespoons butter.
1 cup sour milk.	1 cup cream.

Beat the eggs and sugar together thoroughly. Sift the flour, soda, and salt together, and mix with the meal. Mix all the ingredients but the cream and butter. Melt the butter in a deep pan, using plenty on the sides. Pour in the batter, add (without stirring) a cup of cream, and bake 20 to 30 minutes. When cooked there should be a layer of custard on top of the cake or small bits of custard distributed through it.

For economy's sake milk may be used in place of the cream in this recipe.

This serves six people.

### CORN-MEAL ROLLS

$1\frac{1}{4}$ cups wheat flour.	1 egg.
$\frac{3}{4}$ cup corn meal.	$\frac{1}{2}$ cup milk.
3 teaspoons baking powder.	1 teaspoon salt.
2 tablespoons butter.	

Sift together the flour, baking powder, and salt, and mix with the meal. Rub the butter into the dry ingredients. Beat the egg, add the milk, and add this mixture to the dry ingredients. Add more milk if necessary to make a soft dough. Roll out on a floured board, handling lightly. Cut with a round biscuit cutter, fold like Parker House rolls, and bake in a quick oven.

This makes 14 small rolls.

## RAISED CORN-MEAL MUFFINS

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1 cup scalded milk.                | $\frac{1}{4}$ yeast cake.         |
| 3 tablespoons butter or other fat. | $\frac{1}{4}$ cup lukewarm water. |
| 4 tablespoons sugar.               | 1 cup corn meal.                  |
| 1 teaspoon salt.                   | $1\frac{1}{2}$ cups wheat flour.  |

Add shortening, sugar, and salt to the milk. When lukewarm, add yeast dissolved in the water, corn meal, and flour. Beat well; let rise over night. Beat well and half fill greased muffin rings. Let rise until nearly double and bake in a hot oven for half an hour.

This makes 12 muffins.

## SOFT CORN BREAD (WITHOUT WHEAT)

- |                                      |                       |
|--------------------------------------|-----------------------|
| $\frac{2}{3}$ cup rice.              | 2 or 3 eggs.          |
| $\frac{1}{2}$ cup white corn meal.   | 2 tablespoons butter. |
| 3 cups milk or milk and water mixed. | 1 teaspoon salt.      |

Mix the rice, meal, and salt with the milk in the top of a double boiler, and cook until the rice is nearly soft. Add the butter and the eggs well beaten and transfer to a greased granite baking pan. Bake in a moderate oven for an hour. Serve in the dish in which it is baked.

This serves six people.

## SPOON CORN BREAD (WITHOUT WHEAT)

- |                        |                      |
|------------------------|----------------------|
| 2 cups water.          | 1 tablespoon butter. |
| 1 cup milk.            | 2 teaspoons salt.    |
| 1 cup white corn meal. | 2 eggs.              |

Mix the water and the corn meal. Bring slowly to the boiling point and cook 5 minutes. Add the eggs well beaten and the other ingredients. Beat thoroughly and bake in a well-greased pan for 25 minutes in a hot oven. Serve from the same dish with a spoon.

This serves six people.

## DELICATE SPOON CORN BREAD (WITHOUT WHEAT)

- |                              |                  |
|------------------------------|------------------|
| $\frac{1}{4}$ cup corn meal. | 1 teaspoon salt. |
| 1 teaspoon butter.           | 2 eggs.          |
| 1 tablespoon sugar.          | 2 cups milk.     |



Mix the corn meal and milk. Bring slowly to the boiling point and cook a few minutes. Add the butter, sugar, salt, and yolks of eggs. Lastly, fold in the whites of eggs beaten stiff. Bake in a hot oven 30 minutes. Serve in the dish in which it is cooked.

This serves six people.

### CORN MEAL AND HOMINY BREAD (WITHOUT WHEAT)

1 cup cooked hominy.	1 cup white corn meal.
1 cup milk.	2 eggs.
1 tablespoon melted butter.	1½ teaspoons salt.

Mix the ingredients and bake 30 minutes in a moderate oven.

This serves six people.

### STEAMED CORN-MEAL BREAD

2 cups yellow meal.	1½ teaspoons soda.
1 cup wheat flour.	1½ teaspoons salt.
2¼ cups sour milk.	½ cup molasses.

Sift together the flour, soda, and salt, and stir in the corn meal, mixing thoroughly. Add the molasses and sour milk. Pour into a well-buttered mold, which should not be more than two-thirds full. A lard pail is a good substitute for the mold. Cover closely and steam 5 hours.

Half the recipe makes just the right amount to steam in a 1-pound coffee tin.

This serves eight people.

### BOSTON BROWN BREAD

1 cup corn meal.	1 teaspoon salt.
1 cup rye meal.	¾ cup molasses.
1 cup Graham flour.	2 cups sour milk, or
2½ teaspoons soda.	1¾ cups sweet milk.

Mix and sift the dry ingredients and add the molasses and milk. Beat thoroughly and steam 3½ hours in well-buttered, covered molds. Remove the covers and bake the bread long enough to dry the top.

This may be made also with 1½ cups corn meal and rye meal and no Graham flour.

This serves eight people.

## BOSTON BROWN BREAD WITH FRUIT

Follow recipe for Boston brown bread, adding to the dry ingredients a cup of seeded and shredded raisins or prunes or a cup of Zante currants.

This serves eight people.

## PARCHED CORN-MEAL BISCUITS (WITHOUT WHEAT)

$\frac{1}{2}$  cup yellow corn meal.  
1 teaspoon salt.

1 cup peanut butter.  
 $1\frac{1}{2}$  cups water.

Put the meal into a shallow pan, heat in the oven until it is a delicate brown, stirring frequently. Mix the peanut butter, water, and salt, and heat. While this mixture is hot, stir in the meal, which also should be hot. Beat thoroughly. The dough should be of such consistency that it can be dropped from a spoon. Bake in small cakes in an ungreased pan. This makes 16 biscuits, each of which contains  $\frac{1}{6}$  ounce of protein.

## PARCHED CORN-MEAL BISCUITS, FROSTED

Cover the biscuits prepared according to the above recipe, with a frosting made as follows. Over the top spread chopped peanuts or peanut butter:

$\frac{1}{3}$  cup boiling water.  
 $\frac{3}{4}$  cup granulated sugar.

1 egg white.  
 $\frac{1}{2}$  teaspoon vanilla.

Boil together the sugar and water until the sirup forms a thread when dropped from a spoon. Pour slowly into the well-beaten egg white and beat until it will hold its form. Add flavoring.

## PARCHED CORN-MEAL CAKES

1 cup yellow corn meal.  
2 tablespoons butter.  
2 tablespoons sugar.  
4 teaspoons baking powder.

$\frac{1}{2}$  cup milk.  
2 egg whites.  
 $\frac{1}{2}$  cup wheat flour.

Parch the meal and add butter, sugar, and milk, the flour sifted with the baking powder, and the whites of the eggs beaten stiff. Bake in greased muffin tins and cover with the boiled icing described above.

This recipe makes 12 small cakes.

### Corn-meal Puffs, Griddlecakes, and Waffles

The peculiar granular consistency of corn meal, which is a disadvantage under some circumstances, is an advantage in making such dishes as griddlecakes and waffles, for it renders them very tender.

#### CORN-MEAL PUFFS (WITHOUT WHEAT)

1 pint milk.	$\frac{1}{2}$ teaspoon salt.
$\frac{1}{3}$ cup corn meal.	4 eggs.
4 tablespoons sugar.	Grated nutmeg (if desired).

Cook the milk and meal together 15 minutes with the salt and sugar. When cool, add the eggs well beaten. Bake in cups. Serve with stewed fruit or jam.

This serves six people.

#### CORN-MEAL FRITTERS

By increasing the corn meal in the above recipe by half (i.e., to  $\frac{1}{2}$  cup) the batter is made stiff enough to be dropped into hot fat and fried.

This serves six people.

#### CORN-MEAL PANCAKES

2 cups wheat flour.	$\frac{1}{3}$ cup sugar.
$\frac{1}{2}$ cup corn meal.	$1\frac{1}{2}$ cups boiling water.
$1\frac{1}{2}$ tablespoons baking powder.	$1\frac{1}{4}$ cups milk.
$1\frac{1}{2}$ teaspoons salt.	1 egg.
1 tablespoon melted butter.	

Add meal to boiling water and boil 5 minutes; turn into bowl, add milk and remaining dry ingredients mixed and sifted, then the egg well beaten, and butter. Cook on a greased griddle.

This serves six people.

#### CORN MEAL AND WHEAT WAFFLES

$1\frac{1}{2}$ cups water.	$1\frac{1}{4}$ tablespoons baking powder.
$\frac{1}{2}$ cup white corn meal.	$1\frac{1}{2}$ teaspoons salt.
$1\frac{1}{2}$ cups milk.	Yolks 2 eggs.
3 cups wheat flour.	Whites 2 eggs.
3 tablespoons sugar.	2 tablespoons melted butter.

Cook the meal in boiling water 20 minutes; add milk, dry ingredients mixed and sifted, yolks of eggs well beaten, butter, and whites of eggs beaten stiff. Cook on a greased waffle iron. These waffles are considered by most people better than those made with wheat flour only

This serves six people.

### CORN MEAL AND RICE WAFFLES

$\frac{1}{2}$ cup corn meal.	1 tablespoon melted butter.
$\frac{1}{2}$ cup wheat flour.	$\frac{1}{2}$ teaspoon soda.
1 cup boiled rice.	1 teaspoon salt.
2 eggs well beaten.	1 cup sour milk.

Sift together the flour, soda, and salt. Add the other ingredients and beat thoroughly.

This serves six people.

### BUTTERMILK WAFFLES

3 cups water.	2 teaspoons salt.
2 cups corn meal.	$1\frac{1}{2}$ teaspoons soda.
2 cups wheat flour.	Buttermilk or sour milk
1 cup sweet milk.	enough to make a thin batter.
4 eggs.	
2 tablespoons butter.	

Cook the meal, water, salt, and butter together in a double boiler for 10 minutes. When the mush is cool add the eggs, beaten separately until very light. Sift the flour and soda together. Add the flour and the sweet milk alternately to the corn mixture. Finally add the buttermilk. This mixture is improved by standing a short time.

This serves 10 people.

### CORN-MEAL MUSH

#### METHOD NO. 1

1 cup corn meal.	1 teaspoon salt.
$3\frac{1}{2}$ cups water.	

Bring the salted water to the boiling point in the top of a double boiler. Pour the corn meal slowly into the water, stir-



ring constantly. Cook 3 minutes. Put the upper part of the boiler into the lower part, and cook the mush half an hour and as much longer as convenient. Long cooking improves the taste and probably adds to the thoroughness with which the mush is digested.

The housewife who has no double boiler can make one by using two saucepans of such size that one can be set inside of the other.

#### METHOD NO. 2

1 cup corn meal.	4½ cups water, milk, or milk
1 teaspoon salt.	and water.

Bring the salted water to the boiling point; add the meal slowly, stirring all the time. Put into the fireless cooker and leave for 5 to 10 hours. If the pail holding the mush is set into another pail containing water before being placed into the cooker, the heat will be retained longer. Whether this is necessary or not depends upon the efficiency of the cooker.

#### METHOD NO. 3

1 cup meal.	4 cups milk, whole or skim, or
1 teaspoon salt.	4 cups milk and water.
3½ cups water, or	

Put the ingredients into the top of the double boiler cold and cook 1 hour or longer. If convenient, just before serving bring the mush to the boiling point. This improves its texture and also its flavor.

#### POLENTA

This dish, which is common in Italy, differs little, except in name, from hasty pudding, though it is served in very different ways. Sometimes cheese is added during the cooking. Polenta is often reheated either with tomato sauce, or a meat gravy left over from a meal or with a meat gravy made from a small amount of meat bought for the purpose, or with half tomato sauce and half meat gravy. In any case, the dish is improved by sprinkling each layer of polenta with cheese. When the polenta is to be reheated in gravy, it is well to cut it into small pieces in order that the gravy may be well distributed through the dish.

## SAUCES FOR POLENTA

## TOMATO SAUCE

2 tablespoons butter.	1 cup thick strained tomato
2 tablespoons flour.	juice.
	Salt and pepper.

Melt the butter; cook the flour thoroughly in it; add the tomato juice and seasonings; and cook until smooth, stirring constantly.

## SAVORY SAUCE

Take 2 ounces of salt pork, bacon, or sausage. If bacon or pork is used, cut it into small pieces. Heat until crisp but not burned. In the fat which tries out of the meat, cook a small amount of finely chopped onion and red or green pepper, being careful not to burn them. Add 1 cup of thick tomato juice or a larger amount of uncooked juice, and cook the mixture until it is reduced to a smaller amount. Season with salt. To this sauce capers, mushrooms, or finely chopped pickle may be added.

## FRIED CORN-MEAL MUSH

The custom of packing hasty pudding in granite pans, cutting it into slices, and frying it, is too common to call for special mention here. A less common method in this country is that employed in Italy, where polenta is usually spread out in thin layers on a board and cut into small blocks. These blocks are egged and crumbed, and fried in deep fat. Another method is to mix corn meal in three times its volume of water and to cook it in water only long enough to form a mush, and to complete the cooking by frying the meal in butter or other fat. This is not so stiff as ordinary fried corn-meal mush, and has the advantage of requiring a shorter time for its preparation, as the temperature of fat suitable for frying is far greater than that of boiling water.

## CORN-MEAL MUSH WITH FRUIT

Corn-meal mush is often served with dried fruits, particularly with figs and dates. In preparing such fruit for use with the mush, it usually is necessary to soften it. This can be accomplished easily by washing the fruit and then heating it in a slow

oven. As a result of the heat, the water remaining on the fruit is absorbed, and the fruit softened and also dried on the surface.

#### CORN-MEAL MUSH WITH CHEESE

For this dish, yellow corn meal usually is used. For a mush made with 1 cup of yellow corn meal the usual allowance is  $\frac{1}{2}$  cup, or 2 ounces, of grated cheese. There is, however, no limit to the quantity of cheese which can be added, and the addition of the cheese tends not only to make a more highly nitrogenous and nourishing dish, but also to make a dish which can be eaten without the addition of butter or cream. Like the ordinary corn-meal mush, it is often fried either in deep fat, after having been egged and crumbed, or in a small amount of fat.

#### CHEESE PUDDING

1 quart boiling water.	$\frac{1}{2}$ pound yellow corn meal.
1 tablespoon salt.	$\frac{1}{2}$ pound cheese.
$\frac{1}{2}$ cup milk.	

Into the boiling, salted water pour the corn meal slowly, stirring constantly, and allow to boil 10 minutes; then add most of the cheese and cook 10 minutes more, or until the cheese is melted. Add  $\frac{1}{2}$  cup of milk and cook a few minutes. Pour into a greased baking dish. Brown in the oven. This dish is improved by grating a little hard cheese over the top just before it is baked.

This pudding can be cut into slices when cold and fried.

This serves four to six people.

#### BUTTERMILK CORN-MEAL MUSH

White corn meal cooked in buttermilk makes a dish which resembles cottage cheese in flavor. It may be eaten hot, but is especially palatable when served very cold with cream. For this purpose it is sometimes molded in cups. In making it, allow 1 part of corn meal to 6 parts of buttermilk, and 1 teaspoon of salt to each cup of meal.

#### BAKED CORN-MEAL MUSH

When corn-meal mush is partly done pour it into shallow pans, making a layer not more than 2 inches thick, and cook in an



oven until it is well browned. The product secured is very similar to the original "Johnny cake," which seems to have been simply a corn-meal mush cooked in the oven, or, in some localities, fried. The name, however, has with time come to be applied to a very large variety of corn breads.

#### CORN-MEAL DUMPLINGS

2 cups corn meal.

Boiling water.

1½ teaspoons salt.

Flour for dredging.

Mix the meal and salt; pour boiling water over the meal and stir thoroughly, using water enough to make a thick paste. Form portions of the paste into flat dumplings about 2 inches in diameter. Have ready a kettle of boiling water and drop the dumplings in carefully, cover, and cook 1 hour. These dumplings are often cooked with turnip tops or other greens, with or without the addition of a ham bone or a piece of fat pork. Some cooks dredge the dumplings with flour before boiling them.

This serves eight people.

### Corn Meal and Meat Dishes

A number of dishes are made from corn meal and meat or fish: dishes in which mush is used, or which resemble mush in some particulars. Recipes for such dishes follow:

#### CORN-MEAL MUSH WITH PORK

1 pound lean pork, part meat

1 teaspoon salt.

and part bone.

½ teaspoonful powdered sage.

1 cup corn meal.

Water.

Cook the pork in water until the meat can be removed easily from the bone. Remove the meat, cool the broth, and remove the fat. Reduce the broth to about a quart, or add water enough to bring it up to this amount, and cook the corn meal in it. Add the meat finely chopped and the seasonings. Pack in granite bread tins. Cut into slices and fry. Beef may be used in the same way.

This serves six people.



## ROAST PORK WITH BATTER PUDDING

A dish corresponding to the Yorkshire pudding which is frequently served with roast beef can be made out of corn meal to serve with roast pork.

$\frac{1}{4}$ cup corn meal.	$\frac{1}{2}$ teaspoon salt.
1 cup milk.	2 eggs.

Place the milk, corn meal, and salt in the top of a double boiler and cook them about 10 minutes, or until the meal has expanded to form a thorough mixture. After the mixture has cooled, add the eggs well beaten. Grease gem tins thoroughly, allowing to each about 1 teaspoon of fat from the roast pork. Bake in a moderate oven, basting occasionally with the drippings of the pork.

This serves four people.

## CORN-MEAL SCRAPPLE

1 pig's head split in halves.	Salt and sage.
2 cups corn meal.	

Follow the above directions for cooking corn meal with pork, but use double the amount of water.

## CORN-MEAL FISH BALLS

2 cups cold white corn meal	1 egg.
mush.	1 tablespoon butter.
1 cup shredded codfish.	

Pick over the codfish and soak it to remove salt, if necessary. Combine the ingredients and drop by spoonfuls into hot fat. Drain on porous paper. These codfish balls compare very favorably in taste with those made with potato and are prepared more easily and quickly. The mush must be as dry as possible.

This makes 12 fish balls.

## CHICKEN AND CORN-MEAL CROQUETTES

1 cup white corn meal mush.	1 egg.
1 cup chopped chicken.	Salt and peper.
Few drops onion juice.	

Combine the ingredients and drop by spoonfuls into hot fat.

White corn meal may be combined very satisfactorily with other kinds of cold meat to make croquettes. In general, corn-meal croquettes need not be egged and crumbed like ordinary croquettes, for the hardening of the corn meal on the surface of the mixture forms the necessary crust.

This serves three people.

### TAMALES

Meat from $\frac{1}{2}$ boiled chicken.	1 teaspoon salt.
1 clove garlic or $\frac{1}{2}$ medium-sized onion.	1 cup corn meal.
	2 or 3 small red peppers.
$\frac{1}{4}$ teaspoon cayenne.	Corn husks.

Chop the chicken; season with the cayenne pepper, garlic, or the onion finely chopped, and salt; form the meat into little rolls about 2 inches long and  $\frac{3}{4}$  inch in diameter. Pour boiling water over the meal and stir; use water enough to make a thick paste. Take a heaping tablespoon of the paste, pat it out flat, and wrap a roll of chicken in it; then wrap each roll, as made, in corn husks which have been softened by immersion in hot water, tying the husks with a piece of string close to each end of the roll. Trim off the ends of the corn husks, allowing them to project an inch or two beyond the rolls. Cover the rolls with the broth in which the chicken was cooked, or with boiling salted water. Add 2 or 3 small, sharp, red peppers, and boil for 15 minutes.

Tamales are usually made with chicken, but other meat may be used if desired.

This serves four people.

### ROAST PORK OR FRIED CHICKEN WITH CORN-MEAL MUSH

Blocks of fried corn-meal mush are sometimes served with roast pork, and are a common accompaniment of fried chicken, particularly in the Southern States. The mush is made by the usual method, is cooled and cut into slices, and fried a delicate brown either in a greased pan or in deep fat.

For a boiled corn-meal and apple dumpling, to be eaten with roast pork, see recipe on following page.

### Corn-meal Puddings

There is a large variety of popular and very nutritious puddings made chiefly out of milk, to which a small amount of some starchy substance has been added. The substance most frequently used is probably rice, but corn meal, too, has always been commonly used. The proportion of cereal to milk is always as low as 1 to 12, and sometimes as low as 1 to 16; that is,  $\frac{1}{4}$  to  $\frac{1}{3}$  cup of cereal to 3 or 4 cups of milk. The only other ingredients are sugar or molasses and some flavoring material. Other puddings are made by combining corn meal with milk and eggs.

#### INDIAN PUDDING

5 cups milk.	1 teaspoon salt.
$\frac{1}{3}$ cup corn meal.	1 teaspoon ginger.
$\frac{1}{2}$ cup molasses.	

Cook milk and meal in a double boiler 20 minutes; add molasses, salt, and ginger; pour into buttered pudding dish and bake 2 hours in slow oven; serve with cream.

This serves eight people.

#### CORN MEAL AND FIG PUDDING

1 cup corn meal.	1 cup finely chopped figs.
1 cup molasses.	2 eggs.
6 cups milk (or 4 of milk and 2 of cream).	1 teaspoon salt.

Cook the corn meal with 4 cups of the milk, add the molasses, figs, and salt. When the mixture is cool, add the eggs well beaten. Pour into a buttered pudding dish and bake in a moderate oven for 3 hours or more. When partly cooked add the remainder of the milk without stirring the pudding.

This serves eight or ten people.

#### CORN MEAL AND APPLE PUDDING

For the figs in the above recipe, substitute a pint of finely sliced or chopped sweet apples.

This serves eight or ten people.



## BOILED CORN MEAL AND APPLE DUMPLING

6 tart apples, medium-sized.	1 cup corn meal.
1 teaspoon salt.	Boiling water.

Pour boiling water over the corn meal, to which the salt has been added, using enough water to make a thick paste; stir thoroughly; with the hands flatten out the paste until it is about  $\frac{1}{4}$  inch thick and wrap it around the apples, which have been pared, cored, and halved. Inclose in a pudding cloth and cook in boiling salted water for  $1\frac{1}{2}$  hours. If preferred, the pudding may be put in a bowl, covered with a plate, and steamed.

This is an old-fashioned dish which was served commonly as an accompaniment to roast pork.

This pudding may be used as a dessert by cutting it open before serving, scattering sugar and bits of butter over it and then a little cinnamon or grated nutmeg. Cream or any of the usual pudding sauces may be served with it if desired.

This serves six people.

## Corn-meal Cakes

In making cakes it is often possible to substitute corn meal for part of the flour. In some of the cases given here, in making gingerbread, for example, there is no special advantage in using it, but it is well to know that it can be used in emergencies. In making doughnuts, however, there is a decided advantage in substituting corn meal for part of the flour, for doughnuts so made are much more likely to be tender than those made with wheat flour alone.

## INDIAN-MEAL DOUGHNUTS

$\frac{3}{4}$ cup milk.	$\frac{3}{4}$ cup sugar.
$1\frac{1}{4}$ cups very fine white corn meal.	2 eggs well beaten.
$1\frac{1}{2}$ cups wheat flour.	1 teaspoon cinnamon.
$\frac{1}{4}$ cup butter.	2 teaspoons baking powder.
	1 level teaspoon salt.



Put milk and meal into a double boiler and heat together for about 10 minutes. Add the butter and sugar to the meal. Sift together the wheat flour, baking powder, cinnamon, and salt. Add these and the eggs to the meal. Roll out on a well-floured board; cut into the desired shapes; fry in deep fat; drain and roll in powdered sugar.

This makes 30 medium-sized doughnuts.

### MOLASSES CORN CAKE

2 cups yellow corn meal.	1 cup sour milk.
$\frac{1}{2}$ cup molasses.	$1\frac{1}{2}$ cups sweet milk.
$\frac{1}{2}$ cup sugar.	1 cup wheat flour.
2 tablespoons butter.	$1\frac{1}{2}$ teaspoons soda.
1 teaspoon salt.	1 egg.

Mix the first seven ingredients in a double boiler and cook over hot water. Cook for about 25 minutes after the mixture has become hot. After it has cooled add the wheat flour and soda, thoroughly sifted together, and the egg well beaten. Bake in a shallow tin.

This serves six people.

### CORN-MEAL GINGERBREAD

To the above recipe add  $1\frac{1}{2}$  teaspoons ginger,  $1\frac{1}{2}$  teaspoons cinnamon, and  $\frac{1}{2}$  teaspoon cloves, sifting them with the flour.

This serves six people.

### FRUIT GEMS

$\frac{1}{2}$ cup corn meal.	1 cup milk.
1 cup wheat flour.	1 cup currants or raisins.
3 teaspoons baking powder.	2 eggs.
6 tablespoons sugar.	1 tablespoon flour reserved
2 tablespoons melted butter.	for flouring currants or
1 teaspoon salt.	raisins.

Mix and sift the dry ingredients; add the milk gradually, the eggs well beaten, melted butter, and raisins which have been floured. Bake in a hot oven in buttered gem pans 25 minutes.

This makes 12 cakes.

# U. S. DEPARTMENT OF AGRICULTURE FARMERS' BULLETIN NO. 807

---

## [BREAD AND BREAD MAKING IN THE HOME <sup>1</sup>

CAROLINE L. HUNT

Scientific Assistant, Office of Home Economics, States Relations  
Service

and

HANNAH L. WESSLING

Assistant Chemist, Bureau of Chemistry

---

*Contribution from the States Relations Service*  
A. C. TRUE, Director

---

## INTRODUCTION

The name "bread" is given to a very large number of foods, which differ considerably not only in appearance and taste but also in food value. In the United States, wheat bread raised by means of yeast is most common, and whenever in this bulletin the word "bread" is used alone it may be taken to mean this kind. Other kinds are referred to by such terms as rice bread, rye bread, and self-rising bread.

<sup>1</sup> Prepared under the direction of C. F. Langworthy, Chief, Office of Home Economics.

NOTE.—This bulletin is of special interest to housekeepers.

Bread may be made out of wheat flour, water, yeast, and salt. Even when it contains no other ingredients than these, it has not always the same food value, pound for pound, for flours themselves differ in composition, and, moreover, some flours take up more water than others, the result being moister bread. Sometimes a little sugar or fat is added to the ingredients, and milk is often substituted for part of the water. These substances contribute somewhat to the nutritive value of the bread, but they are used in such small amounts that they are much less important than the flour. The food value of a pound of bread is, therefore, not far different from that of the flour used in making it.

The wheat flour used in making a pound of bread (about  $\frac{2}{3}$  pound, or 11 ounces) contains, in round numbers,  $\frac{1}{2}$  pound of starch, which serves as fuel for the body;  $1\frac{1}{2}$  ounces of protein, which, in addition to serving as fuel, helps to build and repair the body machinery; and 1 ounce of water. The small portion that remains contains fat and sugar, which, like starch, serve chiefly as fuel; cellulose, in the case of whole-wheat bread, which gives needed bulk to the diet and tends to prevent constipation; mineral substances, which help to make bones and teeth and have a large number of other uses; and certain newly discovered substances which are present in very small amounts in many foods and are believed to have an important part to play in keeping people well.

The many substances present in bread, or, rather, in the flour out of which it is made, and the very many uses to which they may be put in the body suggest, at first thought, that wheat alone must be a complete food for supplying every need of the human



body. This is not true, since the nutritive materials are not supplied in the right proportion. Nor are they in any of the other cereals—rye, corn, oats, rice, barley—which are often used in bread making. All cereals contain so much starch that if they are used in quantities sufficient to keep the body in repair and in good running order, they overload it with fuel. Or, to put it in another way, if used only in quantities sufficient to supply the fuel needed, they do not provide enough body-building and body-regulating material. They come so near to being complete foods, however, that in almost every household they are the largest single item in the diet, and in many households they might, in case of need, be used even more largely than they are. This would be an advantage from the standpoint of economy, considering the nourishment that they supply in comparison with their cost.

In most households the products of cereal grains are served partly as breakfast foods, side dishes with meat, and desserts, but chiefly in the form of bread. The quality of the bread served is, therefore, a very important matter, and the different substances used in its preparation must be considered not only as foods but also with reference to the parts they play in the process of bread making.

### Qualities of Good Bread

Good bread is often described as porous or as containing a large number of holes or cells, all of which are of about the same size and shape. It is better for some reasons to think of it as a mass of tiny bubbles made out of flour and water and hardened or fixed into shape by means of heat. This calls attention not only to the size of the holes or cells, but also to the char-



acter of the walls of the cells, which in good bread are always very thin.

A loaf of bread should be light in weight, considering its size, and should have a symmetrical form and an unbroken, golden-brown crust. The crust should be smooth on top and should have a certain luster, to which the term "bloom" has been given.

The loaf as a whole, the crust and the crumb, should be elastic. The loaf, if pressed out of shape, as it often is when slices are cut from it, should regain its form when the pressure is removed. Bits of the crust, if bent a little between the fingers, should show the same power to rebound, as should also the cut surface of the loaf if pressed.

The crumb should be creamy white in color and should have a "sheen," which may be compared with the bloom of the crust. This sheen can best be seen by looking across a slice rather than directly down into it. The distribution of the holes, on the other hand, and the thickness of the walls can best be examined by cutting a very thin slice and holding it up to the light.

The flavor of the bread should be, as nearly as possible, the flavor of wheat developed or brought out by the use of salt. This flavor is not easy to describe but is familiar to those who have tasted the wheat kernel.

### Principal Requirements in Bread Making

Many points should be kept in mind in making bread. These include (1) choice of materials, (2) choice of utensils, (3) cleanliness, (4) proportions of ingredients, (5) measuring, mixing, and molding, (6) care of dough while it is rising, (7) care of bread while it is baking, and (8) care of loaves after they are taken from the oven.

### Materials

Necessary materials: Flour, water, salt, yeast.

Materials occasionally used: Milk, sugar, fat.

### FLOUR

The fact that wheat dough can be made light or changed into a mass of thin-walled bubbles is due to the presence in wheat of a proteid substance known as gluten. Flour, when mixed with water, forms an elastic mass; this is due to the gluten, the particles of which tend to cling together when the dough is pulled or when it is stretched by the formation of bubbles of gas within it. Glutens, however, are not all alike. Some are far more elastic than others and can be more easily stretched. Some, too, are stronger than others, and for that reason break less easily when stretched. Good bread flour, therefore, has not only the right amount but also the right kind of gluten. This depends partly on the kind of wheat from which the flour is made and partly on the way it is milled.

Durum wheat, which is particularly suited for growth in dry climates and is much used in the preparation of macaroni, has a large percentage of gluten. It is not, however, generally used for bread making, because the quality of gluten is different from that of ordinary bread flour. In general, spring wheats, which are raised principally in climates where it is too cold for the wheat seeds to lie in the ground over winter, have more gluten than winter wheat, which is grown in milder climates. Both vary greatly, however, not only in the amount but also in the kind of gluten they contain. A "hard" winter-wheat flour may be as good for bread making as a spring-wheat flour.

The various parts of the wheat kernel differ more than the different kinds of wheat do. The outer coatings, often called "bran," are very rich in cellulose and in mineral substances, and are an important source of certain growth-regulating substances. The kernel, or the real seed, is divided into two parts—the germ, which is very small, and the endosperm, which forms about four-fifths of the entire weight of the seed and its coverings taken together. This endosperm contains all of the different kinds of nutrients present elsewhere in the berry—protein, mineral substances, and others—but, taken as a whole, it has a larger percentage of starch than any other part. The outer portion of the endosperm is, however, particularly rich in protein. It also contains coloring matter, and when included in flour gives to it a creamy white color.

In the old process of milling wheat, all the parts of the berry were ground up together, and the composition of the flour thus obtained was the same as that of the wheat from which it was made. If such flour was sifted in order to make a fine product, however, much of the bran was removed and with it much of the other nutritive material. Graham flour, made according to the original method recommended by Dr. Graham, was so finely ground that no sifting was necessary. This might have been truly called "whole-wheat flour." Small amounts of such flour may be prepared in the household by grinding wheat berries in a coffee mill or similar grinder, and may be used in the preparation of breads.

In large, modern flour mills, wheat is cleaned, tempered (i.e., moistened), and crushed between pairs of steel rollers. These pairs of rollers are adjustable,



much as the rubber rollers of a clothes wringer are. The wheat passes between a series of rollers, each pair being set closer than the pair before. As it does so, the starchy portions which are in the center of the kernel break up first, because they are most brittle. These portions are sifted and the coarser parts returned to the mill. The same pressure that breaks the brittle parts, flattens the bran, which has been toughened by tempering or moistening, and the germ, which, because it contains much fat, is oily rather than brittle. These parts can then be sifted out. By repeated grindings and siftings, a white flour is finally obtained.

A good bread flour should be very fine, but when rubbed between the fingers should feel slightly granular, and if pressed in the palm of the hand should fall apart easily, neither remaining tightly packed nor showing the imprint of the fingers.

Some poor qualities in bread (mustiness, for example) generally are due to the way in which flour has been kept; others (thickness of the cell walls and lack of luster, for example) to the fact that the flour was a poor bread flour in the beginning.

Flour should always be kept in a cool, dry place, away from dust, flies, and vermin, and, since it absorbs flavors easily, away from other foods or other supplies which have strong odors. This applies equally to the home and to the store.

Mustiness in bread is believed to be due to a mold, which is likely to get either into the flour or on the bread itself. Ropiness in bread, a condition particularly likely to occur in hot weather, is due to a common bacillus. Molds and bacilli are living organisms which can generally be killed by the heat of cooking. When, therefore, flour or bread has become in-



fected with either, the receptacle in which it has been kept should be scalded and dried or otherwise sterilized before a new supply of flour is put into it.

In buying bread flour it is best to have a reliable dealer recommend one or more brands, and to try them carefully until a flour is found out of which good bread can be made by following the directions given here or those in a reliable cook book. If good bread can not be made out of a given flour by one method, it often can by another. For instance, some flours are better suited for the short method of bread making, which is here called "the straight-dough process," and others for the "long sponge method." Some doughs are improved by being kneaded twice before they are made into loaves, and some are better if kneaded only once. All reasonable efforts should be made to suit the method to the kind of flour, before the flour is condemned.

## YEAST

Yeast as we use it is made up of a very large number of tiny plants, each one of which is far too small to be seen with the naked eye. These plants have the power to grow and multiply in dough, feeding on the materials it contains. In growing they change sugar, of the kind that is present in flour, and also ordinary sugar, into a gas and alcohol. It is believed, too, that they increase the amount of sugar in the dough by producing it from the starch. If these yeast plants are well distributed, throughout a mass of dough many bubbles with thin walls will be formed. If they are not well distributed there are likely to be no bubbles in some places and large bubbles with thick walls in others.

Yeast plants, when deprived of water and food, stop multiplying. They may be kept alive, however, under these circumstances, and when water and food are again supplied to them they soon begin to increase in number and to act upon any sugar with which they come in contact. In a soft dough, or "sponge," they multiply rapidly at favorable temperatures. The purpose of the familiar process of setting a sponge, therefore, is to get a large number of yeast plants from a few.

Like all living bodies, yeast plants can be killed by heat; can be injured, if not killed, by extreme cold; and do their best work at certain temperatures. These temperatures, in the case of that variety of yeast commonly used in bread making, are between 75° and 90° F., the most favorable temperature being about 86°.

In practical bread making, the fact must be kept in mind that dough, even if prepared by cleanly methods, always contains not only yeast plants but also bacteria, which are likely to make the bread sour or to spoil its flavor in some other way. Many of these bacteria are particularly active at the higher temperatures favorable for the yeast plant. For this reason as high a temperature as 86° should never be adopted, unless every process connected with bread making, from sponge setting to the final rising in the pans, can be pushed through without delay. In most households, where interruptions in bread making are almost unavoidable, a somewhat lower temperature (75° to 80°) is better, even when the bread is made by day and the dough can be watched. Even at these temperatures the entire process of bread making can be carried out in 5 hours, provided enough yeast is

used. When the sponge or dough is to stand as long as overnight, a good temperature is 68° to 70°. Even then a temperature of 65° may be safer, provided it can be maintained and there is no danger of its falling below this point. At these lower temperatures yeast works slowly, to be sure, but so, too, do bacteria.

The kinds of yeast most commonly used are compressed, dry, and liquid yeast. The first-named is very convenient, for in this form the yeast plants are active and ready to begin their work. However, it is not easy to keep it long in good condition and so it is commonly purchased fresh each time it is needed. When in good condition compressed yeast is soft and yet brittle and is the same color throughout, a creamy white. It should have no odor except that of yeast, which is familiar to most people but difficult to describe. Compressed yeast may now be obtained by parcel post, either from manufacturers or from dealers. It is, therefore, no longer out of reach of those who are far from markets.

Dry yeast can be kept for a long time. It is, however, less active than compressed yeast, and for this reason is not convenient when the bread making must be hastened, but only in the long process or "sponge" method described later. Dry yeast is often kept on hand, particularly by housekeepers who are not within easy reach of the markets, for use when other kinds of yeast are not readily obtainable.

Liquid yeast, like compressed yeast, is in active condition. It is easily made at home, and in a cool place can be kept for about 2 weeks. Its ingredients are water, yeast, and a substance which will serve as food for the yeast plants. This food is usually potato or hops. The following recipe, adapted from a



State agricultural college publication,<sup>1</sup> will be found satisfactory.

#### LIQUID YEAST

4 medium-sized potatoes, washed and pared.	1 teaspoon salt.
1 quart hot water.	1 cake dry yeast soaked in $\frac{1}{4}$ cup lukewarm water, or
$\frac{1}{4}$ cup sugar.	1 cake compressed yeast.

Grate or grind the potatoes directly into the water (a food grinder is convenient for the purpose). Boil about 5 minutes, stirring constantly. Add the sugar and salt and allow the mixture to cool. When lukewarm add the yeast. Keep at ordinary room temperature (about 70°) for 24 hours, when it will be ready for use. This yeast should be kept in a cool, dark place. An earthen jar or enamel-ware pail is a good container for it, and it should be scalded before the yeast is put into it.

In making bread a small amount of dough may be saved for use in place of yeast at the next baking. The same care, however, must be taken with it as with liquid yeast; it must be kept covered and in a cool place.

#### MILK

Whole or skim milk may be substituted for part or all of the water used in making bread. It should be scalded thoroughly before use. When the long or overnight process is followed, it is well not to use milk in the sponge, for it is likely to turn sour.

#### FAT

Fat, if used, may be butter, lard, beef fat, cottonseed oil, or any other of the ordinary fats used in cooking. It should, however, be wholesome, of good quality, and

<sup>1</sup> Oreg. Agr. Col. Club Circ. 6 (1916).



in good condition. Bread is so little improved by the addition of fat that it is a mistake to run the slightest risk of injuring its flavor by using fat of questionable quality.

### Utensils

The necessary utensils are mixing bowl, measuring spoons, measuring cup (of standard size, holding about half a pint), mixing spoon or knife, and baking pans. Utensils desirable under some circumstances, particularly when several loaves are to be made, are bread mixer for kneading, molding board, bread raiser, and bread rack.

### MIXING BOWL AND BREAD MIXER

One or two loaves of bread can be kneaded in the bowl in which they are mixed, which "saves dishes." If more loaves are to be made, a bread mixer may be used. Care should be taken, however, to use one of the right size for the amount of dough to be made. When a bread mixer is intended for use in making four loaves it is not reasonable to expect it to be convenient for use in making one loaf. Even when several loaves are made at a time, neither bread mixer nor board is absolutely necessary, for the dough can still be conveniently molded in the bowl if it is first divided into two or three portions.

### BREAD RAISERS

A bread raiser or bread cabinet where an even temperature can be kept, is valuable in laboratory work. In the home, if available, it can be used for the dough or for the sponge and also, in cold weather, for bringing the flour to the desired temperature before it is made into dough

A fireless cooker may be used in place of a cabinet for controlling the temperature of the dough while it is rising, or, in cold weather, dough may be placed in an ordinary unheated oven with some warm water near it in a stone crock or other receptacle in which water cools slowly. A teakettle is convenient for the purpose.

### PANS

Pans holding  $1\frac{1}{2}$  quarts are convenient because they are of the right size for a loaf made with 1 cupful of liquid. The loaves made in them have, too, a good proportion of crust and crumb. About 3 inches in height, 8 inches in length, and  $3\frac{1}{2}$  inches in breadth are good dimensions. If too low, the pans do not support the sides of the loaf properly and make it necessary to use a stiff dough. Some housekeepers use pans twice as wide as those mentioned, which hold two loaves, but, except for a slight saving of labor, these are less desirable, for the loaves are not of good shape, and each has one crustless side.

The material for the pans is of less importance than the size. It may be tin, sheet iron, aluminum, or heat-resistant glass. It is desirable, however, that all the pans used at one baking be of the same material, for heat passes through some materials more rapidly than through others. Seamless pans are easiest to keep clean.

### BREAD RACK

The bread rack consists of wire netting supported on short legs. On this bread can be cooled quickly. A substitute can be made easily at home by stretching wire netting over a wooden frame.

### Cleanliness

Everything connected with the process of bread making should be scrupulously clean. This is true of all forms of cookery, to be sure, but there is a special reason in the case of bread making. Dirt almost always contains bacteria, and these are likely to produce in dough substances which spoil the flavor of the bread. Yeast has no flavor which survives the cooking, and the substances which it produces, carbon dioxide and alcohol, are driven off by the heat of the oven. Bacteria, on the other hand, are likely to produce sour or rancid substances which are not removed by baking. All utensils, therefore, should be clean; the liquids should be scalded; the dry materials should be kept from the dust; liquid yeast should be kept cold and well covered; the hands should be washed and the nails cleaned before they touch the dough. Wooden tooth-picks, which can be used for cleaning the nails and then thrown away, are a convenient part of the equipment for bread making.

### Measuring, Mixing and Molding

In this bulletin it is recommended that for every loaf of bread there should be an allowance of 1 level teaspoonful of salt; 1 level tablespoonful of sugar, and 1 cupful of liquid, which should include any liquid there may be in the yeast. Butter or other fat, if used, should never exceed 1 level tablespoonful for a loaf. Yeast should be  $\frac{1}{8}$  of a cake of compressed yeast, or 2 tablespoonfuls of liquid yeast, if the overnight sponge method of making bread is followed, and  $\frac{1}{2}$  cake of compressed or  $\frac{1}{4}$  cupful of liquid yeast if the short "straight-dough" method is followed. If it is desirable to hasten the process, somewhat more yeast may



be used. The amount of flour differs with every brand, but is always very close to 3 cupfuls or  $\frac{3}{4}$  of a pound for each cupful of liquid. The required amount is sometimes more than 3 cups and in exceptional cases runs below 3 cups.

The water used should be as pure as for drinking purposes; if milk is used it should be scalded. The liquid is usually poured hot over the sugar, salt, and fat in the mixing bowl, though some housekeepers put in the salt and the fat later, because they tend to retard the action of the yeast. If the sponge method of bread making is followed, the yeast and about half of the flour ( $1\frac{1}{2}$  cups for each cup of liquid) are added to the liquid as soon as it has become lukewarm. This sponge usually is made at night, kept at a temperature of  $65^{\circ}$  to  $70^{\circ}$  till morning, and then made into a stiff dough.

In the "straight-dough" or short-day process, all, instead of half, of the flour is added in the beginning. From this point, when a stiff dough is made, this process and the "sponge" process are carried through in exactly the same way.

In making stiff dough out of the sponge or out of the liquid containing yeast, the flour should be added gradually, and what is more important, the dough should be beaten thoroughly, or, when it gets too stiff for this, kneaded, after each addition of flour. If this is not done, too much flour is likely to be added, and this spoils the texture of the bread. The time to stop putting in flour is when the dough can be kneaded without sticking either to the hands or to the board, even when they are unfloured. If for any reason more flour than this is added, the dough should be softened again by means of water or milk.



Dough is allowed to rise once, and sometimes twice, before it is made into loaves. If it is to be allowed to rise twice, the first kneading should be only sufficient to mix the ingredients, and the second should be continued 10 or 15 minutes. If the dough is allowed to rise only once, it should be kneaded for 10 or 15 minutes when it is first mixed. A second kneading is believed to improve the flavor and texture of the bread.

In making the dough, the first portions of flour may be mixed with the liquid by means of a flat knife or spoon. The knife has an advantage over the spoon because it is flexible and can be used for scraping the dough from the sides of the bowl. Kneading is simply another form of mixing, its purpose being to move one part of the dough over another and thus to bring new parts of flour and liquid into contact. It is better done with the balls of the hands than with the fingers, which often pierce the dough without accomplishing much in the way of mixing.

### Temperature and Care of the Rising Dough

Dough rises most rapidly at a temperature of about 86° F., and if it can be watched carefully, so that there is no loss of time at any point, this is the best temperature. Under most other circumstances a somewhat lower temperature, about 80° F., is better. It is easy to keep the right temperature if the dough is put into a bread raiser or a fireless cooker, and a thermometer is used. Experienced housekeepers, to be sure, recognize quite well the right temperature for raising and baking bread by the sense of feeling, but uniform results are most easily obtained by the use of a thermometer. Inexperienced bread makers

will do well to ask themselves whether they know the feeling of water or air at 80° or 86° F., and if they do not, to use a thermometer for a time at least. By doing this they can learn very quickly what experience alone would take a long time to teach.

Dough should be kept covered while it is rising, for otherwise a crust will form on top of it and interfere with the expansion. Some housekeepers brush the dough over with melted fat, but this is not necessary if the dough is well covered.

Beginners often have difficulty in telling whether the dough is ready to be divided into loaves and put into pans. A good rule is to measure its volume. When it is ready to be made into loaves the dough for each loaf, if made out of hard-wheat flour, should amount to 3 pints; if made from soft flour, to about  $2\frac{1}{2}$  pints.

The levels to which these masses of dough will reach in the mixing bowl can easily be determined beforehand and marked. For illustration: If one loaf of bread is to be made: before mixing it, pour 3 pints of water into the mixing bowl and mark the point to which the water comes. This will indicate the height to which the dough should rise.

When recipes direct that dough be allowed to double or treble in volume it is convenient to have a measuring glass to determine the expansion. An ordinary tumbler will do, but a glass of smaller diameter, like a small jelly glass, is better. Before the dough is set to rise, tear off a small piece and pack it in the glass. Note the height to which it comes and mark the place it will reach when its volume had doubled or trebled, as the case may be. Put this beside the large loaves of bread and use it as an indicator.

### Shaping the Loaves

When the dough has risen sufficiently, cut or tear it into the required number of loaves. Take each piece of dough in the hands and work it lightly in such a way as to stretch the underside, which is to become the top of the loaf. In forming the loaf, make no effort to fit it to the shape of the pan, for in rising it will fill out the corners. Strive merely to form it into an oblong piece with a smooth surface.

### Baking

Loaves made with 1 cupful of liquid each should be baked 50 minutes. They should begin to brown in about 15 minutes. After that time the temperature of the oven should be lowered so that the loaves will bake slowly. The temperature should be about 400° F. to begin with, should be increased to 425° F. and then dropped gradually to about 380° F. The surest way to get these temperatures is by means of an oven thermometer or an oven gauge. In the absence of these the following test may be made: Put into the oven a small piece of white paper, a white cracker, or half a level teaspoonful of flour spread in a layer  $\frac{1}{4}$  or  $\frac{1}{8}$  inch thick on a tin plate. If it becomes a light golden brown in 5 minutes, the oven is about right in temperature to begin the baking.

If possible, pans should be so placed in the oven that the air will circulate around them. If they touch each other or the sides of the oven, the loaves will rise unevenly and be of unsightly shape. If the oven is crowded, it may be necessary to change the position of the pans occasionally to insure well-shaped loaves.



### Care of Bread after Baking

The best way to care for bread after it is taken from the oven is to place the loaves, uncovered, on a bread rack or similar utensil, preferably where the wind will blow on them. Or the loaves may be placed across the edges of the empty bread pans in such a way that almost their entire surface is exposed. This method of caring for fresh bread, however, can be followed only in a place which is free from dust and flies; otherwise the bread must be covered.

The practice, common in the past, of wrapping warm bread in cloths to soften the crust, is losing favor because it is likely to spoil the flavor of the bread.

### Recipes for Making Bread

Directions for making wheat bread by several slightly different processes are given below. Under the first recipes, that for the short or straight process, the exact amounts for one, two, three, and four loaves are given, and these, with very slight changes, are the right amounts for use in the three recipes that follow after. The measurements have been given thus in detail for the convenience of the housekeeper. It is a comparatively easy matter to calculate the amount needed for several loaves from that needed for one, but in some cases utensils are used in making large amounts. For example, sugar for four loaves is conveniently measured in a cup, while that for one loaf is measured with a tablespoon.



## Wheat Bread

## SHORT OR STRAIGHT-DOUGH PROCESS

## ONE LOAF

1 cup lukewarm milk, water, or a mixture of the two.	1 teaspoon salt.
$\frac{1}{2}$ cake compressed yeast, or	1 tablespoon sugar.
$\frac{3}{4}$ cup lukewarm milk, water, or a mixture of the two.	Fat, if used, 1 tablespoon, or less.
$\frac{1}{4}$ cup liquid yeast.	3 cups sifted flour.

Original bulk of dough, 1 pint; bulk when ready to be made into loaves,  $2\frac{1}{2}$  to 3 pints.

## TWO LOAVES

2 cups lukewarm milk, water, or a mixture of the two.	2 teaspoons salt.
1 cake compressed yeast, or	2 tablespoons sugar.
$1\frac{1}{2}$ cups lukewarm milk, water, or a mixture of the two.	Fat, if used, 2 tablespoonfuls, or less.
$\frac{1}{2}$ cup liquid yeast.	6 cups or 3 pints sifted flour.

Original bulk of dough, 1 quart; bulk when ready to be made into loaves,  $2\frac{1}{2}$  to 3 quarts.

## THREE LOAVES

3 cups lukewarm milk, water, or a mixture of the two.	3 teaspoons salt.
$1\frac{1}{2}$ cakes compressed yeast, or	3 tablespoons sugar.
$2\frac{1}{4}$ cups lukewarm milk, water, or a mixture of the two.	Fat, if used, 3 tablespoons, or less.
$\frac{3}{4}$ cup liquid yeast.	9 cups or $4\frac{1}{2}$ pints sifted flour.

Original bulk of dough, 3 pints; bulk when ready to be made into loaves,  $3\frac{1}{2}$  to  $4\frac{1}{2}$  quarts.

## FOUR LOAVES

1 quart lukewarm milk, water, or a mixture of the two.	1½ tablespoons salt.
2 cakes compressed yeast, or	¼ cup sugar.
3 cups lukewarm milk, water, or a mixture of the two.	Fat, if used, ¼ cup, or less.
1 cup liquid yeast.	3 quarts sifted flour.

Original bulk of dough, 2 quarts; bulk when ready to be made into loaves, 5 to 6 quarts.

Boil the water or scald the milk. Put the sugar and salt (and fat, if used) into a mixing bowl. Pour the hot liquid over it and allow it to become lukewarm. Mix the yeast with a little of the lukewarm liquid and add it to the rest of the liquid. If convenient, set this aside in a warm place, not over 86° F., for 1 hour; if not convenient to set it aside, add the flour at once, putting in a little at a time and kneading until the dough is of such consistency that it sticks neither to the bowl nor to the hands. This requires about 10 minutes. Cover, and allow to rise 1¾ hours at a temperature of 86°; it may be better to set it at a lower temperature, but the lower the temperature the longer the time required for the rising. Cut down the dough from the sides of the bowl; grease the hands slightly. Knead a little and set aside to rise again for one hour. With a good bread flour, the dough would treble its bulk in each rising. With a soft wheat flour, it should not rise much beyond twice its volume. Divide into portions, mold, and place in greased pans of standard size (1½ quarts). Allow to rise until a light touch will make a slight dent. With good bread flour this happens when the dough reaches the top of the pans. Bake 50 minutes. (See directions for baking.)

## SHORT SPONGE METHOD

Bread can be made during the day by what is known as the "short sponge" method. All the ingredients are the same as for the "short or straight-dough" process, but only half of the flour is added at first. When this mixture, which is called a "sponge," is so light that it will fall at the slightest touch, it is ready for the addition of the rest of the flour.

## OVERNIGHT SPONGE METHOD

Use the same proportions as for the short process, except in the case of the yeast, which should be one-eighth cake of compressed yeast or 2 tablespoonfuls of the liquid yeast for each loaf. Use water rather than milk. In the evening mix the yeast with water, salt, and half of the flour, and beat thoroughly. Cover and place at a temperature of 65° to 70° F., or that of an ordinary room. In the morning add the sugar and the rest of the flour and proceed as in the case of the short process.

## OVERNIGHT STRAIGHT-DOUGH METHOD

Use the same ingredients as for the overnight sponge method, but put in all the ingredients at night.

## Raised Biscuit

Part of the dough prepared for wheat bread can be baked in the form of biscuits. Enough dough for one loaf, or that made from 1 cup of liquid, will make 24 small biscuits. Cut or pull small pieces from the dough and form them in the same way the loaves are formed. Hold the dough in one hand and shape it with the fingers of the other hand. The stroke should be light and from the outside inward, in order to stretch the



bottom of the dough, which is to be the top of the biscuit. The biscuit may be placed either close together or some distance apart in the pan; in either case they should be rubbed over with melted butter. Allow them to treble their bulk and then bake them. The oven should be hotter than for baking bread, and they should begin to brown at the end of 5 minutes and should be done in 20 minutes.

#### PARKER HOUSE ROLLS

2 cups milk.	1 teaspoon salt.
3 tablespoons butter.	1 cake compressed yeast.
2 tablespoons sugar.	Flour.

Put the butter, sugar, and salt in a mixing bowl. Scald the milk and pour it into the bowl. When it is lukewarm add the yeast, mixing it with a little of the liquid first. Add 3 cups of flour, beat thoroughly, cover, and let the dough rise until it doubles its bulk. Cut down the dough and add flour gradually until the mixture can be molded without sticking either to the hand or to the bowl. Let it rise again until about twice its original bulk and roll it on a floured board and cut it with a biscuit cutter. Brush the pieces over with fat, crease each piece through the center with a knife and fold it over. Let it rise again and bake in hot oven about 15 minutes.

#### BAKING-POWDER BISCUIT

2 cups pastry flour.	2 tablespoons butter or other fat.
4 teaspoons baking powder.	
1½ teaspoons salt.	About $\frac{3}{4}$ cup milk, water, or a mixture of the two.

Mix and sift the dry ingredients. Work in the fat with a fork or with the fingers. Add the liquid grad-



ually, making a dough that is of the right consistency to roll out easily. Turn out on a floured board and roll to  $\frac{1}{2}$  inch thickness. Cut with a biscuit cutter, place on a buttered pan, and bake in a hot oven about 15 minutes.

An easier way is to add so much liquid that the biscuits can be dropped from a spoon on the baking tin. This saves the use of board and rolling pin.

Baking-powder biscuits and many other kinds of bread that are served hot contain more fat than ordinary wheat bread does and are usually eaten with more butter. These facts should be taken into consideration in planning meals, particularly those which are to be kept within a given fuel value.

### Mixed Wheat Flour Breads

The recipes given above for white bread can be followed in making bread out of part graham and part white flour. The usual proportions are either one part of graham to two parts of white, or half graham and half white. In all cases, however, white flour should be used for making the sponge. In place of the sugar, an equal amount of molasses may be used. Such bread will not rise quite as much as bread made of white flour only.

### WHOLE-WHEAT OR GRAHAM BREAD

1½ cups lukewarm milk.	3 cups whole-wheat or graham
3 tablespoons brown sugar.	flour.
1½ teaspoons salt.	½ yeast cake.

Scald the milk, together with the sugar and salt. When lukewarm, add the yeast, mixing it first with a little of the milk. Add the flour, beat well, and let it

double its volume. Beat it thoroughly, put into a pan, and let it rise. In a pan of standard size it should come nearly to the top.

The above recipe may be used in preparing bread from home-ground meal. There are many households, particularly in the country, where clean whole wheat can be obtained at moderate cost. If ground in the ordinary coffee mill, such wheat makes a coarse bread, not very light in texture, but of such good flavor that it may well be used occasionally to give variety to the diet. It is useful, too, in places where good bran can not be obtained easily and where coarse breads are desired as a means of preventing constipation.

In making such bread with a view to economy the housekeeper should compute what it will cost her per loaf, including labor and fuel, as compared with other breads she makes. Skim milk instead of whole milk can be used; homemade yeast, either liquid or in dry cakes, is a possibility; and some might like the bread with less sugar, or unsweetened. Another recipe which has been worked out, follows:

#### HOME-GROUND WHEAT BREAD

1½ cups water or skim milk.	3 cups home-ground wheat
1½ teaspoons salt.	flour.
1 tablespoon sugar.	½ cake dry yeast or 1 gill of liquid yeast.

Set a sponge at night, using half of the flour. In the morning add the rest of the flour, beat well, put into a greased pan, allow to rise until it doubles its bulk, and bake. (For particulars as to setting the sponge, etc., see directions for making wheat bread.)

### Self-rising Bread

This bread, which is commonly called by the misleading name of "salt-rising bread," has been known in one form or another for generations. It has been a particular favorite when and where it was difficult to get satisfactory yeast.

1 cup milk.	1 tablespoon sugar.
2 tablespoons white corn meal.	Butter (if used), 1 tablespoon.
1 teaspoon salt.	Flour.

Scald the milk. Allow it to cool until it is lukewarm; then add the salt, sugar, and corn meal. Place in a fruit can or a heavy crock or pitcher, and surround by water at about 120° F. Water at this temperature is the hottest in which the hand can be held without inconvenience, and can be secured by mixing nearly equal parts of boiling water and tap water (unless the tap water is unusually warm). Allow the mixture to stand for 6 or 7 hours, or until it shows signs of fermentation. If it has fermented sufficiently, the gas can be heard as it escapes. This leaven contains enough liquid for one loaf. If more loaves are needed, add 1 cupful of water, 1 teaspoonful of salt, 1 tablespoonful of sugar, and 1 tablespoonful of butter for each additional loaf. Make a soft sponge by adding a cupful of flour for each loaf to be made. Beat thoroughly and put the sponge again at the temperature of about 120° F. When it is very light, add more flour gradually until the dough is so stiff that it can be kneaded without sticking to the hands or to the board. Knead 10 or 15 minutes, put at once into the pans, allow to rise until about two and one-half times its original bulk, and bake. Self-rising bread is never so light as the bread raised with yeast. A loaf made with 1 cupful



of liquid therefore will come not quite up to the top of a pan of standard size.

### Potato Bread

The following recipes for potato bread have been so made as to use a large amount of potato as compared with flour. Excellent bread can be made with less potato. In making recipes it should be remembered that a pound of mashed potato contains about  $1\frac{1}{4}$  cupfuls of water and starch, and other substances about equivalent, for the purpose, to those in 1 cupful of wheat flour.

### STRAIGHT-DOUGH METHOD

#### FOUR 1-POUND LOAVES

3 pounds boiled and peeled potatoes (equivalent to about $3\frac{3}{4}$ pounds water and 3 cups flour).	$1\frac{1}{2}$ level tablespoons salt.
	3 level tablespoons sugar.
	2 cakes compressed yeast.
	4 tablespoons water.
$2\frac{1}{4}$ pounds bread flour.	

Clean thoroughly and boil, without paring, 12 potatoes of medium size, allowing them to become very soft. Pour off the water, peel and mash the potatoes while hot, being careful to leave no lumps. Take 3 pounds, or 5 solidly packed half-pint cupfuls of mashed potato, and when at the temperature of lukewarm water add to it the yeast, rubbed smooth with 3 tablespoonfuls of lukewarm water. Rinse the cup in which the yeast was mixed with another tablespoonful of water and add to the potato. Next add the salt, the sugar, and about 4 ounces of the flour, or 1 scant half pint of sifted flour. Mix thoroughly with the hand, but do not add any more water at this stage. Let this mixture rise until it has become very light, which should

take about 2 hours if the sponge is at a temperature of about 86° F. To this well-risen sponge, which will now be found to be very soft, add the remainder of the flour, kneading thoroughly until a smooth and elastic dough has been formed. The dough must be very stiff, since the boiled potato contains a large amount of water, which causes the dough to soften as it ferments. Therefore add no more water to the dough unless it is absolutely necessary. Set back to rise until it has trebled in volume, which will require another hour or two. Divide the dough into four parts, mold them separately, and place in greased pans which have been warmed slightly. Allow the loaves to rise until they have doubled in volume and bake 45 minutes at a temperature of 400° to 425° F.

### SPONGE METHOD

#### FOUR 1-POUND LOAVES

3 pounds boiled and peeled potatoes (equivalent to about 3¾ pounds water and 3 cups flour).	1½ level tablespoons salt.
	3 level tablespoons sugar.
	1 cake compressed yeast.
	4 tablespoons water.
2¼ pounds bread flour.	

Clean, boil, peel, and mash the potatoes as directed for the straight-dough method. In the evening take 1½ pounds, or 2½ solidly packed half-pint cupfuls of the cool mashed potato, add to it the salt, 4 ounces of flour (or 1 scant half-pint cupful), and the yeast, rubbed smooth with water, reserving 1 spoonful to rinse the cup. In the morning add the remainder of the potato, the sugar, and the rest of the flour. Knead thoroughly until a smooth and very stiff dough is formed. Set away at 80° to 86° F. for about 2 hours,

or until the dough has trebled in volume. Make into 4 loaves and proceed as in the straight-dough method.

### Potato Rolls

Very palatable rolls can be made from a similar mixture of boiled potatoes and flour by adding fat and sugar. The following proportions will yield about 1 dozen small rolls:

8 ounces boiled and peeled potatoes.	2 tablespoons lukewarm water, milk, or cream.
6 ounces or $1\frac{1}{2}$ cups sifted flour.	2 tablespoons sugar.
$\frac{1}{3}$ cake compressed yeast.	2 tablespoons butter.
$\frac{3}{4}$ level teaspoon salt.	

Boil, peel, and mash the potatoes as directed for bread making. Add to this the salt, the yeast rubbed smooth and mixed with the water, or other liquid, and lastly 2 tablespoons flour. Set this mixture to rise at about 86° F. and allow it to rise till a touch will cause it to fall. Add to this sponge the butter, the sugar, and the remainder of the flour, and, if necessary, enough more flour to make a very stiff dough. Knead thoroughly until a smooth dough has been formed which is no longer sticky. Set back to rise again, and when the dough has trebled in volume knead lightly, form into small balls, and place, not too close together, in greased pans. Let rise until double in volume and bake 20 minutes in a moderately hot oven (about 400° F.)

### CORN-MEAL-AND-WHEAT BREAD

$1\frac{1}{2}$ cups milk, water, or a mixture of the two.	$\frac{1}{4}$ cup liquid yeast.
$\frac{1}{2}$ cake compressed yeast,	$1\frac{1}{2}$ teaspoons salt.
or	1 tablespoon sugar.
$1\frac{1}{4}$ cups milk, water, or a mixture of the two.	Butter (if used), 1 tablespoon.
	1 cup corn meal.
	2 cups wheat flour.



Pour  $1\frac{1}{4}$  cupfuls of the water over the corn meal, salt, sugar, and fat (if used), and heat the mixture gradually to the boiling point or nearly to it and cook 20 minutes. This cooking can be done best in a double boiler. The water is sufficient only to soften the meal a little. Allow the meal to cool to about the temperature of the room and add the flour and yeast, mixed with the rest of the water, or the  $\frac{1}{4}$  cupful of liquid yeast. Mold thoroughly, let rise until it doubles its bulk, make into a loaf, place in a pan of standard size, and allow to rise until it nearly fills the pan, and bake 45 or 50 minutes.

#### RICE BREAD

1 cup lukewarm water, milk, or a mixture of the two.	1 tablespoon sugar.
1 cup uncooked rice.	Butter (if used), 1 tablespoon or less.
$1\frac{1}{4}$ teaspoons salt.	$\frac{1}{2}$ cake compressed yeast.
	2 cups wheat flour.

Steam the rice with one-half of the liquid until it is soft. This is done better in a steamer than in a double boiler, for the liquid is so small in amount that the rice does not become soft readily and the presence of the steam helps. Put the sugar, salt, and fat (if used) into the mixing bowl and pour over them the remaining liquid ( $\frac{1}{2}$  cupful). When the mixture has become lukewarm add the yeast and  $\frac{1}{2}$  cupful of flour. Allow this sponge to rise until very light. Add the boiled rice, which should have been cooled until lukewarm, and the rest of the flour. This dough is so thick that some pressure is required to work in the last portions of the flour. Allow the dough to rise until it has doubled its bulk, form into a loaf, place in a pan of standard size, allow it to rise until it nearly reaches the top of the pan, and bake.

## RYE BREAD

- |                       |                                 |
|-----------------------|---------------------------------|
| 1 quart milk.         | 1 cake compressed yeast.        |
| 2 tablespoons sugar.  | 3 cups flour (1 cup being wheat |
| 4 teaspoons salt.     | and the remainder rye).         |
| 2 tablespoons butter. |                                 |

Follow the directions for making wheat bread according to the short process until after the bread has been molded the second time. At this point the dough should be placed in a 6-quart bowl lined with a cloth into which flour has been rubbed. When the dough has risen to the top of the bowl, turn out on a hot sheet iron (a dripping pan inverted will do), over which 1 tablespoonful of flour has been sprinkled, and put it immediately into a very hot oven. After 10 minutes lower the temperature somewhat and bake for 1 hour. This recipe, which is used by permission of Mrs. Edith M. Thomas,<sup>1</sup> is a modification of an old German household method of making rye bread.

## NUT BREAD

- |                            |                               |
|----------------------------|-------------------------------|
| 1 egg.                     | 1 teaspoon salt.              |
| 1 cup milk.                | 1 cup English walnut or pecan |
| $\frac{1}{2}$ cup sugar.   | or hickory nut meats, cut     |
| 3 cups flour.              | into small pieces.            |
| 3 teaspoons baking powder. |                               |

Sift together the flour, baking powder, salt, and sugar, and add the milk, the egg well beaten, and the nut meats. Place in a well-buttered pan and let rise one hour. Bake  $\frac{3}{4}$  hour in a moderate oven.

## ROLLED-OATS BREAD

- |                                |                                   |
|--------------------------------|-----------------------------------|
| 2 cups boiling water.          | $\frac{1}{4}$ cup lukewarm water. |
| $\frac{1}{2}$ cup brown sugar. | 1 $\frac{1}{2}$ cups rolled oats. |
| 2 teaspoons salt.              | 5 cups flour.                     |
| 1 yeast cake.                  |                                   |

<sup>1</sup> Mary at the Farm and Book of Recipes. By Edith M. Thomas. Quakertown, Pa.: 1915, p. 171.

Dissolve the yeast cake in the lukewarm water. Pour the boiling water over the rolled oats, salt, and sugar, and let stand until lukewarm; add the dissolved yeast and flour. Let rise until very light, beat thoroughly, and turn into two buttered bread pans. When the loaves have doubled their volume bake them an hour in a moderate oven.

### How to Judge Bread

Expert bread makers and judges agree very closely upon the qualities of good bread, and the bread which they grade high suits the taste of the great majority of people. Even those who do not like it at first come in time to prefer it to the kinds of bread that are graded lower.

It is well for experienced housekeepers who wish to be good bread makers to have their bread judged once or twice by experts, because some qualities, which are difficult to describe in words, can be demonstrated easily to the eye. Opportunities for this often are given at fairs, exhibitions, schools, etc. It is even more helpful, however, for beginners to learn how to judge their own bread skillfully, for by this means they are able to trace good or bad qualities to their causes quickly and thus to judge not only the bread itself but also the methods that have been followed in making it.

There are many good score cards for bread judging. They differ somewhat in detail, to be sure, but a loaf of bread judged by one of them usually will receive about the same mark that it would if judged by any of the others. The score card used in the Bureau of Chemistry, United States Department of Agriculture, for ordinary yeast raised white bread, is as follows:



### JUDGING THE QUALITY OF BREAD—A BREAD SCORE CARD

		Points.
1. General appearance....	{ Shape.....	5
	{ Smoothness of crust.....	5
	{ Depth and evenness of color..	5
2. Lightness.....		10
3. Crust...;	{ Thickness.....	5
	{ Quality (crispness and elasticity).....	5
4. Crumb..	{ Color.....	10
	{ Texture (size and uniformity of cells, thin- ness of cell walls).....	15
	{ Elasticity (softness and springiness).....	15
5. Flavor (taste and odor).....		25
Total.....		100

### Nutritive Value of Bread and Its Place in the Diet

Setting aside convenience, cost, and other such matters, it makes no difference whether the nutritive material of cereals is contributed to the diet in the form of bread or breakfast cereals, side dishes with meat, or desserts. In any case they may be used to the extent of nearly a pound a day in the diet of a man at moderate muscular work and to the extent of about 3 pounds a day in the diet of the typical family—father, mother, and three children between babyhood and adolescence. This would be equal to more than a pound of bread in the case of the man and  $4\frac{1}{2}$  pounds in the case of the family. Even if used to this extent cereals would not necessarily crowd out other foods—meats, eggs, milk, fruits, vegetables, butter, sugar, etc., needed to complete the ration or to make it taste good.

The amount of protein in breads and other cereal foods is too low as compared with fuel to make them perfectly balanced foods. The protein may be in-

creased somewhat by the use of milk instead of water. The milk used in making a loaf of bread, even if it is skimmed milk, adds as much protein as there is contained in one egg, about  $\frac{1}{3}$  ounce of sugar, and a considerable amount of mineral matter. There is no object, however, in using milk for this purpose if it costs more than the same amount of food in some other form, or if the milk itself can be more attractively served in some other way.

Those substances which serve only as fuel are represented in wheat chiefly by the starch, though there is a little fat and often a little sugar. Experience has shown a very general preference for eating bread with butter or other fat material. This increases its fuel value and serves to lessen the proportion of body-building material. In the same way the use of fat in the preparation of breads or biscuits tends to decrease the amount of body-building material in proportion to fuel. A given weight, therefore, of bread and butter, or of bread containing a considerable amount of fat requires more protein-rich food (flesh foods, eggs, milk, cheese, or the like) to "balance it" than the same weight of plain bread does. These facts should be kept in mind in planning meals.

So far as mineral matter is concerned, bread is particularly rich in phosphorus. It should be supplemented, however, by something which contains more lime and iron, especially in the case of children. Milk provides the lime, and fresh fruits and vegetables the iron. If the latter are served in reasonable abundance, the kind of bread used is not a matter of great importance. If, on the other hand, fresh fruits and vegetables can not be obtained, it is considered desirable to use whole-grain flour in order to bring up the amount

of mineral matters and of cellulose and to be sure of a sufficient supply of certain important growth-regulating substances.

The use of flours which contain more or less of the bran is often recommended on the ground that they are better sources of protein, mineral substances, cellulose, and growth stimulating or regulatory substances. It is true that they have more of these substances as compared with starch than white flours have. Side by side with this fact, however, should be considered the fact that they are not quite so thoroughly assimilated as white flours, or, in other words, a larger amount of them escapes digestion. This offsets any advantage which they have over white flours as sources of protein, but not, according to recent theories of nutrition, as sources of mineral substances and growth-regulating substances. When, therefore, these flours can be obtained at the same or nearly the same price as white flours they merit consideration as sources of mineral and growth-regulating substances in comparison with milk, fruits, vegetables, and others. Even if one thus replaces some milk, fruit, and vegetables, it is not wise to omit them entirely.

To sum up, bread is the largest single item in the diet of the great majority of people. It should not, however, be the only item and, if it is to be rounded out into a satisfying ration, it must be accompanied by reasonable quantities of fruits and vegetables and of foods richer than it is itself in protein, in fat, and in sugar. In the case of little children, the protein-rich food should be milk. It is probable that if bread were uniformly well made it would be used in even larger quantities than at present, and this from the standpoint of economy would be a great advantage.



U. S. DEPARTMENT OF AGRICULTURE  
FARMERS' BULLETIN NO. 487

---

CHEESE AND ITS ECONOMICAL USES IN THE  
DIET

C. F. LANGWORTHY, Ph.D.

Chief of Office of Home Economics, States Relations Service

and

CAROLINE L. HUNT, A. B.

Expert in Nutrition, Office of Home Economics

---

INTRODUCTION

Cheese is believed to be the oldest of the dairy products and the first form in which milk was preserved for future use. One may conjecture that it owes its origin to the accidental storing and ripening of sour milk curd. Although it has been a staple food with many races for uncounted years, there is a widespread belief that it is suitable for use chiefly in small quantities as an accessory to the diet, and that in large quantities it is likely to produce physiological disturbances. We are inclined, therefore, to think of those who make cheese one of the chief articles of their diet as being driven to this course by necessity rather than being led to it by choice.

Because of these opinions extensive studies have been

carried on as a part of the Department Work in Home Economics, of the food value, thoroughness of digestibility, ease of digestion, physiological effect, and special character of cheese as food as well as of methods which are followed in preparing it for the table. The conclusion drawn from this extended study is, in brief, that cheese properly prepared and used is not generally a cause of physiological disturbances, and that it may easily be introduced into the bill of fare in such quantities as to serve as the chief source of nitrogenous food and may be made a substitute for other nitrogenous foods when such substitution is desired. The results of these studies have been brought together in this bulletin with a view to making them helpful to all interested in the subject, but particularly to housekeepers.

From the standpoint of the housekeeper, cheese is of importance because of its high nutritive value, particularly its high percentage of protein or muscle-forming materials, because of the ease with which it can be kept and prepared for the table, and because of its appetizing flavor and of the great variety of ways in which it can be served.

There is something to be said also of the value of cheese to that not inconsiderable number of individuals who must occasionally cater for themselves—those men and women in business life, for example, who find it convenient neither to carry lunches nor to go to restaurants. For these, cheese offers a convenient way of supplying the necessary protein, for it can usually be obtained in good condition in any neighborhood. Combined with crackers, some of the ready-cooked cereals, or bread, and with fruit, it makes a fairly well-balanced meal.

## Kinds of Cheese Used in American Homes

The American factory cheese—the so-called American cream cheese—is of the English Cheddar type, and as it is the most commonly used of all commercial varieties in the United States, may be taken as a standard. Other types are, however, well known, particularly in cities and large towns where there are well-stocked markets and stores, and it is interesting to note also, at least briefly, the characteristics of some of them. Full descriptions of a very large number of cheeses (about 250 in all) may be found in an earlier bulletin of this department.<sup>1</sup>

### Cheddar and American Full-cream Cheese

Cheddar cheese—named from the English village where it originated—is a comparatively old type of cheese, very popular in England and also in the United States. The name is now more fitly applied to a process than to any particular shape.

Cheddar cheese is made from sweet cows' milk, which may be skimmed, partly skimmed, or unskimmed. If made from unskimmed milk the cheese is called "full cream." If cream is removed the cheese is designated "part-skim" or "skim," as the case may be.

Cheese of Cheddar type as made in the United States is perhaps most often marketed in large, flat, round forms, 13 to 16 inches in diameter, about 5 or 6 inches in height, and weighing 26 to 32 pounds each, though other shapes and sizes are also fairly common. It is usually pale to darker yellow in color, though it may be white when uncolored. When fresh it is mild in flavor, but when well ripened has a characteristic and sharp taste. The new cheese is soft, though nor waxy, in

<sup>1</sup> U. S. Dept. Agr., Bur. Anim. Indus. Bul. 146.



texture, and may be easily shaved or broken into small pieces. When well ripened it may be finely grated.

These characteristics, together with its distinctive and peculiar flavor and its wide distribution in the markets, are qualities which help to make it the variety most commonly used in the United States.

Sage cheese is a variety of Cheddar cheese, which is flavored with sage and is further characterized by the green mottled appearance formerly due to bits of sage leaf but now generally obtained in another way.

#### English Dairy Cheese

From the standpoint of the cook who frequently wishes to use grated cheese, this variety is important. Though made in much the same way as Cheddar, it differs from it, in that the curd is heated to a somewhat higher temperature, and the cheese is therefore harder. It commonly sells for somewhat more per pound than the standard or American factory variety and is likely to be found only in the larger markets.

#### Soft Cream Cheeses

Cream cheese, true to name, is made from rich cream thickened by souring or from sweet cream thickened with rennet. The whey is removed by draining. It is then covered, salted, and turned occasionally, being ready for market in 5 to 10 days. A variety is also made with rennet from cream of low fat content, as well as a number of other special sorts much more common in France than in the United States.

The term "cream cheese," however, is an elastic one and includes many varieties which are sold under special trade names. Such cheese is common in most markets.

Soft cream cheese differs from standard cheese, so

far as composition is concerned, in having more water and fat and less protein, water usually making up about one-half of the total weight. It differs also in being much more perishable. These cheeses commonly sell for 10 or 15 cents each, which is about 40 to 50 cents a pound.

Of late there have been on the market varieties of such cheese or of Neufchâtel, made by combining the cheese with chopped pimento. These bring a relatively high price in market and may be easily prepared at home if this seems more convenient.

#### Neufchâtel Cheese

This very popular variety—named from a town in northeastern France—is similar in appearance and in the way it is marketed to soft cream cheese. It is made either from whole or skim milk curdled with rennet. After draining and pressing, it is kneaded thoroughly, formed into small rolls or blocks, and then ripened until special molds develop, which requires about 4 weeks. It is then wrapped in tinfoil and marketed.

#### Parmesan Cheese

This is a name given outside of Italy to a very hard cheese which in that country is said to be known as Grana, a name given because of the granular appearance which it has after it has been broken. It is sometimes sold in grated form and brings a relatively high price, but is more commonly sold ungrated. When well made it will keep for years and may be easily broken and grated. It is very generally used in Europe for serving with soups, for seasoning macaroni, and for other similar purposes, and is quite common in American markets.

### Sap Sago

This is a skim-milk cheese made in Switzerland, which is suitable for grating. It contains, for every 4 pounds of cheese, 1 pound of a clover (*Melilotus cæruleus*) grown in Switzerland. It is greenish in color and has an unusual flavor. It is not high priced.

### Gorgonzola and Roquefort

These are highly flavored cheeses characterized by the presence of molds through their entire mass. Roquefort is made from the milk of sheep; Gorgonzola, from cows' milk.

### Potted or Sandwich Cheeses

Ordinary cheese is often mixed with butter or oil in the proportion of 5 parts of cheese to 1 of butter or oil, by weight. The mixture is sometimes seasoned with mustard or with curry powder. Such cheeses, unseasoned or seasoned, are on the market in great variety. Potted cheese may be easily prepared at home if the housekeeper wishes to take the trouble.

### Swiss Cheese (Emmentaler, Gruyère, etc.)

This term as used in America is somewhat vague. Different names are given to the varieties according to the districts of Switzerland in which they are made, but they are all similar and characterized by a mild, sweetish flavor and the presence of large holes or "eyes." Foreign and domestic brands are to be found in most markets. They are suitable for cooking purposes, as well as for use without being cooked, and are much used in this way in Europe, and well known and liked in the United States.



### Edam Cheese

This is a cheese made in Holland. It is molded in spherical form, and the outside is usually dyed red. It is usual in this country to cut off a section of the top, which serves as a lid, and to scoop out the inside as needed. In Holland it is frequently served in slices, particularly when it is fresh. Edam cheese is seldom used in cookery in American homes, though thrifty housewives, after the greater part of the cheese has been removed, often stuff the hollow shell with cooked and seasoned macaroni, rice, or something similar and bake.

### Brie and Camembert Cheese

These are very soft rennet cheeses of foreign origin and of somewhat smaller nutritive value than standard cheese, and of strong flavor and odor. They are not often used in cookery, but are used as an accompaniment to other foods. The Bureau of Animal Industry and the Connecticut Storrs Experiment Station in cooperation have experimented with the making of Camembert cheese with marked success, and have published a full account of the work.<sup>1</sup>

### Cottage Cheese

Cottage cheese and other sour milk and cream cheeses, junket, Devonshire cream, and a number of other cheese-like products are described in the section which deals with homemade cheese.

### The Care of Cheese in the Home

One of the best ways of keeping cheese which has been cut is to wrap it in a slightly damp cloth and then in

<sup>1</sup> U. S. Dept. Agr., Bur. Anim. Indus. Buls. 71, 98, 109, 115, 120, Circ. 145; Conn. Storrs Sta. Buls. 35, 46, and 58.

paper, and to keep it in a cool place. To dampen the cloth, sprinkle it and then wring it. It should seem hardly damp to the touch. Paraffin paper may be used in place of the cloth. When cheese is put in a covered dish, the air should never be wholly excluded, for if this is done, it molds more readily.

### Cheese as a Food

Cheese is used in general in two ways—in small quantities, chiefly for its flavor; and in large quantities, for its nutritive value as well as for its flavor. Some varieties of cheese are used chiefly for the first purpose, others chiefly for the second. Those which are used chiefly for their flavor, many of which are high priced, contribute little to the food value of the diet, because of the small quantity used at a time. They have an important part to play, however, in making the diet attractive and palatable. The intelligent housekeeper thinks of them as not necessities, but as lying within what has been called “the region of choice.” Having first satisfied herself that her family is receiving sufficient nourishment, she then, according to her means and ideas of an attractive diet, chooses among these foods and others which are to be considered luxuries.

Those cheeses, on the other hand, which are suitable to be eaten in large quantities and which are comparatively low priced, are important not only from the point of view of flavor, but also from the point of view of their nutritive value. Among such cheeses the one which, as noted above, is known to the trade as standard factory cheese and to the housewife as American cheese stands out preeminently. Therefore when the word “cheese” is used without specification in the

following pages it may be taken to refer to this particular variety.

### Nutritive Value of Cheese

So far as its composition is concerned, cheese is entitled to be considered as directly comparable with meat. It is so used by the peasants of some parts of Europe, and was formerly so used among many other groups of people. The fact that it is not more commonly so used in this country is probably due to several causes. One cause is habit, which makes the meal seem incomplete unless it includes meat; another is the fact that since cheese has a more pronounced flavor than meat, it is not so likely to be generally acceptable as the chief food of a meal. There is always likely to be at least one member of the family who does not relish it in quantity. Another cause is the fact that it is commonly believed to be indigestible, and still another is the fact that housekeepers, through lack of experience, are much less skillful in the arrangement of bills of fare in which cheese is the central food than they are in arranging bills of fare in which meat is thus used. These two causes will be considered in sections which follow.

### The Digestibility of Cheese

As was stated above, cheese has been thought a cause of digestive disturbances, but work recently done by the Office of Experiment Stations, in cooperation with the Bureau of Animal Industry, and briefly summed up in a recent publication tends to disprove this.

In the large number of experiments which were conducted, young men in good health were fed on a diet



consisting of bread and fruit combined with American factory cheese which was made with different amounts of rennet and in different stages of ripening. The results showed that over 90 per cent of the nitrogenous material of the cheese was digested—that is, retained in the body—and nearly 90 per cent of the energy it supplied was available. In other words, cheese compares favorably with other foods in thoroughness of digestion—that is, in the percentage finally digested. Furthermore, it did not cause constipation or other physiological disturbances.

The above statement refers to full-cream cheese. Experiments made at the same time gave practically the same values for the digestibility of skim-milk cheese, of Swiss cheese, of Roquefort and Camembert cheese, and of cottage cheese.

The burning sensation or similar sensations sometimes experienced after eating certain sorts of cheese has been attributed to the presence of small amounts of free fatty acids. It is commonly said that cheese is difficult to digest, the idea being that the body expends more labor in assimilating it than is required for other comparable foods. Experiments recently carried on by the Office of Experiment Stations in which the respiration calorimeter was used to study the energy expenditure during the period of active digestion, do not indicate that cheese differs materially in ease of digestion from a comparable amount of meat. Uncooked full-cream cheese was used in these experiments. Another series recently begun by the Office of Experiment Stations with cooked cheese, though not yet sufficiently advanced to be conclusive, indicates that cheese thus eaten does not differ materially from raw cheese in this respect.

In connection with the use of cooked cheese in the diet, one fact should always be kept in mind. This is that, in common with all other fatty foods, cheese which has been overheated in cooking is likely to contain burned—that is, decomposed—fats. Disturbances from this cause, however, should be laid to poor cooking and not to the composition of this special food.

The use of potassium bicarbonate has often been recommended for increasing the digestibility of cheese, the amount suggested being a level teaspoonful to a pound of cheese. That the bicarbonate renders the cheese soluble in any appreciable degree, as has been claimed, is not apparent from a number of experiments which have been made. It does, however, neutralize some of the free fatty acids of the cheese, thus destroying some of the characteristic flavor. To some people this may be an advantage, but by others it would be counted a disadvantage.

### The Use of Cheese in the Diet

It has been the purpose, in preparing this discussion of cheese, to consider ways in which mild-flavored sorts may serve as staple articles of diet, rather than the use of highly flavored varieties as appetizers and as accompaniments of other foods. The use of highly flavored cheese as a condiment is customary and may profitably be extended, since it offers a simple way of adding to the attractiveness of the diet. The variety of the cheese selected is a matter of choice, some persons preferring such kinds as well-ripened American full-cream cheese or the potted cheese, and others such sorts as Roquefort, Camembert, and other varieties. From the physiologist's stand-

point, cheese used in this way for its flavor should really form a part of a well-balanced meal rather than be added to a meal which already supplies an abundance of nutritive material. In other words, condimental cheeses may better accompany a moderate than a very generous menu.

In considering the use of cheese in quantity as an integral part of the diet there are many possibilities, from simple combinations like bread and cheese to elaborate dishes in which cheese is used as a flavor and as a principal constituent.

As has been pointed out, cheese, being rich in both protein and fat, would logically replace such foods as meat, fish, and eggs when taken in quantity, rather than cereal foods characterized by a large amount of starch, or succulent foods, such as vegetables and fruits. In planning menus of which cheese forms a large part the housekeeper should bear these facts in mind.

### **Bill-of-fare Making with Cheese as the Central Food**

Since meat has so generally been the chief protein food of a meal, and the kind selected usually has determined the choice of vegetables and condiments, it is not strange that very many housekeepers should be inexperienced and consequently unskillful in planning meals in which cheese is substituted for meat when for any reason they may desire to make such a change. In seeking skill they might take a suggestion from the experiments to which reference has been made, and also from a case investigated and reported by the Office of Experiment Stations, of a man who lived for months upon a diet of bread, fruit, and cheese, and who re-



mained in good health, and active, and did not weary of the monotony of the diet.

The first two articles of the diet mentioned, namely, the bread and the cheese, could have been taken in such amounts as to constitute what is usually considered a balanced ration, i.e., in such amounts as to supply the right quantity of muscle-forming foods in comparison with the energy value. The bread and cheese taken with the fruit, however, make a ration which is well balanced not only in the older and more widely accepted sense, but also in the more modern sense that it makes an attractive and palatable combination of foods, as well as a balanced ration, and thus favors digestion. The watery and refreshing fruits or succulent vegetables with their large supply of cellulose are a pleasant contrast to the concentrated and fatty cheese.

Housekeepers would probably find that if in planning menus of which a cheese dish is the chief feature they were to take pains to supply also crisp, watery vegetables, water cress, celery, lettuce served with a dressing or with salt alone, or simple fruit salads, and would give preference to refreshing fruits, either fresh or cooked, rather than to what are known as heavy desserts, they would in general be more successful in pleasing those who are served.

There is another point also to be considered in combining cheese with other foods. Whether it is raw or cooked it is likely to be somewhat soft, and so seems to call for the harder kinds of bread—crusty rolls or biscuit, zwieback, toast, pulled bread, rye bread, the harder brown breads, or crackers, and some of the numerous crisp ready-to-eat cereal breakfast foods. Brittle cookies, too, seem more suitable than rich soft cakes or puddings for the dessert in such meals.

A few bills of fare are given below which experience has shown to represent combinations of dishes which are palatable and which, if eaten in usual amounts, will supply protein and energy in proportions which accord with usual dietary standards. Menus such as these are more commonly served at lunch or at supper, but they might equally well be served for dinner, the selection of dishes for any meal being of course chiefly a matter of custom and convenience for those who have any range of choice.

SUGGESTED BILLS OF FARE IN WHICH CHEESE  
DISHES ARE THE CHIEF SOURCE OF PROTEIN  
AND FAT

MENU NO. 1

Macaroni and cheese.  
Raisin bread or date bread.  
Orange and water-cress salad.  
Baked apples.  
Sugar cookies.  
Cocoa.

MENU NO. 2

Cheese fondue.  
Toast, zwieback, or thin and  
crisp baking powder biscuit.  
Celery.  
Potatoes, baked, boiled, or fried  
in deep fat.  
Peas, or some other fresh vege-  
tables.

MENU NO. 2—*Continued*

Coffee.  
Fruit salad with crisp cookies  
or meringues.

MENU NO. 3

Clear soup.  
Baked eggs with cheese, or  
Boston roast.  
Baked potatoes.  
Lettuce salad.  
A sweet jelly, crab-apple or  
quince for example, or a  
preserve.  
Rye bread.  
Orange or banana shortcake.  
Tea.

These bills of fare should be taken as suggestive merely and not as a solution of the problem. In fact, the whole art of making bills of fare needs developing. There is abundant evidence that overeating, where it exists, is frequently due to the fact that meals are not

skillfully planned. People often continue eating after they have taken enough in total bulk because they have not had all they want of some particular kind of food. The meal has contained too large a percentage of proteid or too much starch; has been too moist or too dry; too highly flavored or not sufficiently flavored. Bill-of-fare making calls not only for knowledge of food values but also for skill in combining flavors and textures.

In this discussion of menu making, and of the use of cheese as an integral part of the diet, the aim has been to suggest ways of using cheese to add to the palatability of meals made up of usual dishes, and to suggest dishes containing cheese which could serve as substitutes for meat dishes when so desired, and also for dishes of many sorts to be used as taste suggests and in which the nutritive value as well as the flavor is increased by the addition of cheese. If cheese is used and in quantity, it is obvious that some other proteid and fat foods should be diminished, in order that the meal or day's menu may not be unduly hearty.

For the convenience of the housekeeper, a number of recipes for cheese dishes are given in later pages, these being preceded by directions for making cottage cheese and other similar cheeses which are usually made in the home.

### Homemade Cheese

Even as late as a generation or two ago cheese of different kinds was made at home for family use, as sour-milk or cottage cheese still is, and cheese making was very generally a farm industry, cheese, like butter, being sold by the farmer who made it. Cottage cheese is very commonly homemade. Most types of cheese,



however, are now as a rule made on a large scale in factories where advantage may be taken of labor-saving devices. The general topic of farm cheese making has been considered in an earlier bulletin of this series,<sup>1</sup> prepared by the Dairy Division of the Bureau of Animal Industry.

### CURDS AND WHEY

Cheese curds and whey, an old-fashioned dish, which is often spoken of in accounts of life in earlier times, sometimes refers to sour-milk curd and sometimes to curd separated with rennet. This dish when made with rennet is much like junket and though far less common to-day than was once the case is wholesome and palatable.

### COTTAGE CHEESE

This cheese is very commonly prepared in the home, and the process of making it is very simple. It consists merely of curdling the milk, separating the curd from the whey, seasoning, and pressing it.

The curd is formed by the souring of the milk, and the process is hastened if the milk is kept warm, the best temperature being about blood heat, 96° F. A temperature much above this should be avoided, as the curd is likely to become hard and tough if much heated. The danger is usually not that the whole will be overheated but that the portion nearest the fire will be. In the old-fashioned kitchen there was usually a place where the milk could stand till it was uniformly warm throughout. With our present cooking arrangements it is often desirable to hasten the process. This may be done by setting the milk into a pan of warm water or by pouring hot water directly into the milk itself. The effect of the latter method is to remove much more of the acid than when the whey is left undiluted. Some consider this a great advantage.

If, for any reason, the curd is overheated, it should be put through a meat chopper. This will insure cottage cheese of excellent texture.

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 166.

If the milk is thoroughly chilled before the whey is drained off, it retains more of the fat than if this is done when warm. Under no circumstances, however, is much of the fat retained in cottage cheese. It is therefore more economical to make it out of skim milk and to add the fat to the curd in the form of butter or cream.

Chopped parsley, caraway seeds, chopped olives, and pimento may all be used for flavoring if such flavored cheese is preferred to plain cottage cheese.

Cottage cheese<sup>1</sup> is most commonly consumed immediately, but if made in quantity for commercial purposes, it may be packed in tubs and placed in cold storage. Sometimes it is formed into rolls or blocks and wrapped in tinfoil when marketed. Such cheese is used without ripening.

Though cottage cheese is usually made by allowing the milk to sour naturally, it is sometimes more convenient to curdle the milk by adding rennet, and some housekeepers have a preference for cottage cheese thus made, since the flavor is milder and the acid taste which it possesses when made from sour milk is lacking.

### SOUR-CREAM CHEESE

When cream is to be made into cheese similar to cottage cheese, it should be drained without having previously been heated. The drainage is facilitated by moistening the cloth in salt water before the cream is poured in. The curd is formed either by souring or by the addition of rennet.

### UNCOOKED CURD, OR FRENCH COTTAGE CHEESE

The French make cheese from sour milk without heating it. They pour the milk into earthen molds which have holes in the bottom. A very fine sieve may be used instead of the molds. The whey drips out and the curd assumes a custard-like consistency and takes the shape of the mold. When sufficiently stiff, the cheese is chilled, and is eaten with sweet cream and sugar. It is a staple dessert in many French families, especially in hot weather, and is delicious served with acid fruit, such as currants, or with strawberries.

<sup>1</sup> North Carolina Sta. Bul. 210.

## JUNKET

If cottage cheese is made from sweet milk and rennet and served without breaking and separating the curd and whey, the dish is called junket. It is customary to season it a little, as with grated nutmeg or with cinnamon and sugar.

## BUTTERMILK CHEESE

At the Wisconsin Experiment Station<sup>1</sup> a method has been devised for making a soft moist cheese out of buttermilk. When made on a large scale, as it might be in creameries, there are various precautions to be taken which are pointed out in the publication cited. In making it in small quantities, these precautions are unnecessary, and the method is even simpler than that of making cottage cheese, because the quality does not depend so much on the temperature.

To make the buttermilk cheese, heat buttermilk gradually to about 130° or 140° F. Allow to cool, and strain it. As the curd will settle to the bottom, most of the whey may be poured off before the draining is begun.

This cheese is, of course, almost wholly without fat, and yet, probably because the particles of curd are very finely divided, it has a smooth consistency, which suggests the presence of fat. It may be served seasoned with salt only or it may be mixed with butter or cream and seasonings. It is suitable for combining with olives and pimentos, or for any use to which the ordinary cream cheeses are put.

## BUTTERMILK CREAM

This product also was devised by the Wisconsin Experiment Station. By controlling the temperature in heating the buttermilk and not allowing it to go above 100° F., a compound is made which after draining has the consistency of a very thick cream. It is claimed by the station investigators that this "cream" is suitable for eating on bread in place of butter.

The recipes given later suggest ways of making a salad dressing out of buttermilk cream.

<sup>1</sup> Wisconsin Sta. Bul. 195.



### DEVONSHIRE CREAM

Devonshire cream somewhat resembles sweet cream in flavor and consistency. It is very much liked in England, where it is commonly eaten with fresh or preserved fruit, but is not so well known in America.

To make Devonshire cream, allow a pan of whole milk to stand for 24 hours in a cool place or for 12 hours in a warmer place. Place the pan on the cooler part of the stove and heat until the milk is very hot, but not to the boiling point. If heated too much a thick skin will form on the surface. The more slowly the milk is heated the better. Having been heated, the milk should be kept in a cool place for 24 hours and then skimmed. The thick cream obtained has a characteristic flavor and texture.

### Cheese Dishes and their Preparation

The list of cheese dishes in the culinary literature of this and other countries is a long one, but most of them are variations of a comparatively small number of general types. Those which have been selected and studied experimentally represent the principal types and in many cases have been adapted to American methods of preparations and tastes. In some instances, this has resulted in new and perhaps more rational combinations than those which served as models.

For convenience, the cheese dishes included in this bulletin have been grouped under the following heads:

(1) Cheese dishes which may serve as meat substitutes.

(2) Cheese soups, and vegetables cooked with cheese.

(3) Cheese salads, sandwiches, and similar dishes.

(4) Cheese pastry, cheese sweets, and similar dishes.

Variety may be obtained in the recipes by varying the flavorings. Among the best flavorings for cheese dishes are onion, chives, and the ordinary green sweet pepper. Since the cheese needs very little cooking,

however, and onion or the pepper needs a great deal, they should always be previously cooked, either by stewing in a very little water, or by cooking in butter. The seeds of the pepper, of course, should be removed before cooking. Where chopped celery is used, as it may be in most of these dishes, it, too, should be cooked beforehand until tender. Other good flavors are mustard, curry powder, onion juice, chopped olives, pimento, and, according to European recipes, nutmeg or mace.

In preparing the cheese, it often has been found convenient to use a very coarse grater, having slits instead of the usual rounded holes. Such a grater, in spite of its name, shaves the cheese instead of grating it. When the cheese is soft this is an advantage, since the grater does not become clogged.

### **Cheese Dishes which may be Used in the Same Way as Meat**

Meat is wholesome and relished by most persons, yet it is not essential to a well-balanced meal, and there are many housekeepers who for one reason or another are interested in lessening the amount of meat which they provide or in substituting some other foods for it. The problem with the average family is undoubtedly more often the occasional substitution of other palatable dishes for the sake of variety, for reasons of economy, or for some other reason than the general replacement of meat dishes by other things.

Foods which are to be served in place of meat should be rich in protein and fat and should also be savory. Cheese naturally suggests itself as a substitute for meat, since it is rich in the same kinds of nutrients which

meat supplies, is a staple food with which everyone is familiar, and is one which can be used in a great variety of ways. In substituting cheese for meat, especial pains should be taken to serve dishes which are relished by the members of the family. A number of recipes for dishes which contain cheese are given below. They are preceded by several recipes for cheese sauces which, as will appear, are called for in the preparation of some of the more substantial dishes.

#### CHEESE SAUCE NO. 1

1 cupful of milk.	1 ounce of cheese ( $\frac{1}{4}$ cupful of
2 tablespoonfuls of flour.	grated cheese).
	Salt and pepper.

Thicken the milk with the flour and just before serving add the cheese, stirring until it is melted.

This sauce is suitable to use in preparing creamed eggs, or to pour over toast, making a dish corresponding to ordinary milk toast, except for the presence of cheese. It may be seasoned with a little curry powder and poured over hard-boiled eggs.

#### CHEESE SAUCE NO. 2

Same as cheese sauce No. 1, except that the cheese is increased from 1 to 2 ounces.

This sauce is suitable for using with macaroni or rice, or for baking with crackers soaked in milk.

#### CHEESE SAUCE NO. 3

Same as cheese sauce No. 1, except that 2 cupfuls of grated cheese or 8 ounces are used. This may be used upon toast as a substitute for Welsh rabbit.

#### CHEESE SAUCE NO. 4

Same as cheese sauce No. 2, save that 2 tablespoonfuls of melted butter are mixed with the flour before the latter is put into the milk. The sauce is therefore very rich in fat and has only a mild flavor of cheese.



Among the recipes for dishes which may be used like meat, the first 30 are such that, eaten in usual quantities they will provide much the same kind and amount of nutritive material as the ordinary servings of meat dishes used at dinner. In several cases there is a resemblance in appearance and flavor to common meat dishes, which would doubtless be a point in their favor with many families.

While, chiefly owing to custom, it may not accord with the taste of the family to serve cheese dishes at dinner in place of meat, it is much more in accord with usual dietary habits in American homes to serve such dishes at least occasionally for lunch, for supper, or for breakfast; that is, for a less formal meal than dinner. The last group of recipes in this section, beginning with "breakfast cereals with cheese," supply rather smaller proportions of nutritive materials than those in the first group and so may be more suitable for use at the less hearty meals. There is no hard and fast line to be drawn between the two groups, however, and many of the recipes may be used interchangeably.

In the recipes calling for large amounts of cheese the food value is given, not in figures, but in comparison with beef of average composition and average percentage of waste. This comparison is necessarily rough owing to the varying composition of the foods and the varying weights of such ingredients as a cupful of grated cheese or bread crumbs. In making the comparisons, beef of average composition has been considered to have 15.2 per cent of protein, and a fuel value of 935 calories per pound; ordinary American cheese has been considered to have 26 per cent of protein and a fuel value of 1,965 calories per pound. After many weighings, 4 ounces was decided to be the

average weight of a cupful of cheese and  $2\frac{1}{2}$  ounces the average weight of a cupful of bread crumbs. These weights have been taken, therefore, in calculating the food value of dishes. When cheese is very soft, however, it may be pressed into a cup and measured like butter. Under these circumstances, the weight of a cupful of cheese may be considered  $\frac{1}{2}$  pound. The price of cheese is taken as 22 cents a pound, of butter 25 cents a pound, of eggs 25 cents a dozen, in this and all similar calculations in this bulletin. Prices vary with time, place, and season. Those mentioned above are such as were paid for materials at the time the experiments here summarized were made and are not extreme values in either direction. Like all such estimates, the calculations are only relative, and the housekeeper who wishes to estimate the comparative cost of the cheese dishes and other foods can readily do so by taking into account the amount of materials used and the prices paid for ingredients at any particular time.

#### CHEESE FONDUE NO. 1

$1\frac{1}{3}$ cupfuls of soft, stale bread crumbs.	4 eggs.
6 ounces of cheese ( $1\frac{1}{2}$ cupfuls of grated cheese or $1\frac{1}{3}$ cupfuls of cheese cut into small pieces).	1 cupful of hot water.
	$\frac{1}{2}$ teaspoonful of salt.

Mix the water, bread crumbs, salt, and cheese; add the yolks thoroughly beaten; into this mixture cut and fold the whites of eggs beaten until stiff. Pour into a buttered baking dish and cook 30 minutes in a moderate oven. Serve at once.

The food values of this dish, made with the above quantities, is almost exactly the same as that of a pound of beef of average composition and a pound of potatoes combined. It contains about 80 grams of proteids and has a fuel value of about 1,300 calories. Estimated cost, 18 cents.

## CHEESE FONDUE NO. 2

1½ cupfuls of hot milk.	½ of a pound of cheese (1½ cup-
1½ cupfuls of soft, stale bread	fuls of grated cheese or 1
crumbs.	cupful of cheese cut into
1 tablespoonful of butter.	small pieces).
4 eggs.	½ teaspoonful of salt.

Prepare as in previous recipe.

The protein value of this dish is equal to that of 1½ pounds of potato and beef, the fuel value, however, being much in excess of these. Calculated cost, 22 cents.

In making either of these fondues, rice or other cereals may be substituted for bread crumbs. One-fourth cupful of rice measured before cooking, or 1 cupful of cooked rice or other cereals, should be used.

A comparison of the recipes for the two fondues may indicate the general principle on which the recipes in this bulletin have been worked out. The second recipe is one commonly found in cook books. In the first one, the butter has been omitted and water substituted for milk and the amount of cheese is slightly increased. This makes a somewhat cheaper dish and one which is less rich because its percentage of fat is not so great. For this reason it is easier to adjust to the ordinary bill of fare. A dish in which there is combined cheese with its large percentage of fat, butter with its 85 per cent of fat, and eggs with their 10 per cent of fat, is too rich to admit of being combined rationally with other fatty dishes. It therefore limits the number of dishes that may be served with it, making milk soup, for example, or dishes containing white sauce or those containing much butter or oil seem out of place. The omission of butter from the ordinary recipes and the substitution of water or skimmed milk for whole milk may perhaps be the means of making cheese dishes more wholesome and more generally acceptable.

Another advantage of omitting butter from cheese dishes and of substituting water or skimmed milk for whole milk is that it makes it possible to increase the amount of cheese without making the dish too rich. This is of advantage to those who like the flavor of cheese, and also it tends to increase the tissue-forming value of the dish, particularly if skimmed milk is used rather than water.



## BOILED FONDUE

1½ cupfuls of bread crumbs.	1 egg.
1½ cupfuls of milk.	2 tablespoonfuls of butter.
1½ cupfuls of cheese cut into small pieces.	6 ounces of crackers.

Soak the bread in the milk. Melt the butter and add the cheese. When the cheese has melted add the soaked crumbs, the eggs slightly beaten, and the seasoning. Cook a short time and serve on toasted crackers.

Since it consists of essentially the same ingredients, the food value of this dish is obviously much the same as that of fondue made in other ways.

## RICE FONDUE

1 cupful of boiled rice.	½ teaspoonful of salt.
2 tablespoonfuls of milk.	1 teaspoonful of some commercial meat sauce, or similar flavoring.
4 eggs.	
1 cupful of grated cheese.	

Heat the rice in the milk, add the other ingredients, and cook slowly until the cheese is melted. Serve on crackers or toast.

The food value is not far from that of a pound of beef of average composition, and the calculated cost is 15 cents.

## CORN AND CHEESE SOUFFLÉ

1 tablespoonful of butter.	1 cupful of chopped corn.
1 tablespoonful of chopped green pepper.	1 cupful of grated cheese.
¼ cupful of flour.	3 eggs.
2 cupfuls of milk.	½ teaspoonful of salt.

Melt the butter and cook the pepper thoroughly in it. Make a sauce out of the flour, milk, and cheese; add the corn, cheese, yolks, and seasoning; cut and fold in the whites beaten stiffly; turn into a buttered baking dish and bake in a moderate oven 30 minutes.

Made with skimmed milk and without butter, this dish has a food value slightly in excess of a pound of beef and a pound of potatoes. Calculated cost, about 20 cents.

## WELSH RABBIT

- |                               |  |
|-------------------------------|--|
| 1 tablespoonful of butter.    | $\frac{1}{2}$ pound of cheese, cut into    |
| 1 teaspoonful of cornstarch.  | small pieces.                              |
| $\frac{1}{2}$ cupful of milk. | $\frac{1}{4}$ teaspoonful each of salt and |
|                               | mustard.                                   |
|                               | A speck of cayenne pepper.                 |

Cook the cornstarch in the butter; then add the milk gradually and cook 2 minutes; add the cheese and stir until it is melted. Season and serve on crackers or bread toasted on one side, the rabbit being poured over the untoasted side. Food value is that of about  $\frac{3}{4}$  pound of beef. Calculated cost, 13 cents.

## TOMATO RABBIT

- |   |                                    |
|---|------------------------------------|
| 2 tablespoonfuls of butter.                           | $\frac{1}{8}$ teaspoonful of soda. |
| 2 tablespoonfuls of flour.                            | 1 pound of cheese.                 |
| $\frac{3}{4}$ cupful of milk.                         | 2 eggs, slightly beaten.           |
| $\frac{3}{4}$ cupful of stewed and strained tomatoes. | Salt, mustard, cayenne pepper.     |

Cook the butter and flour together, add the milk, and as soon as the mixture thickens add tomatoes and soda. Then add cheese, eggs, and seasoning. Serve on toasted whole wheat or Graham bread.

## GREEN CORN, TOMATO AND CHEESE

- |   |                                       |
|---|---------------------------------------|
| 1 tablespoonful of butter.                        | 2 egg yolks.                          |
| 2 cups of grated cheese.                          | 1 teaspoonful of salt.                |
| $\frac{3}{4}$ cup of canned or grated fresh corn. | $\frac{1}{2}$ teaspoonful of paprika. |
| 1 ripe pimento.                                   | 1 clove of garlic.                    |
| $\frac{1}{2}$ cup of tomato purée.                | 4 slices of bread.                    |

Into the melted butter stir the cheese until it, too, is melted. Then add the corn and pimento, stir for a moment and add the egg yolks beaten and mixed with the tomato juice and the salt and paprika. Have ready the bread, toasted on one side and very lightly rubbed on its untoasted side with the garlic cut

in two. Pour the mixture over the untoasted side of the bread and serve at once. A poached egg is sometimes placed on top of each portion, making a very nutritious combination.

### MACARONI AND CHEESE NO. 1

1 cupful of macaroni, broken into small pieces.	2 tablespoonfuls of flour. $\frac{1}{4}$ to $\frac{1}{2}$ pound of cheese.
2 quarts of boiling salted water.	$\frac{1}{2}$ teaspoonful of salt.
1 cupful of milk.	Speck of cayenne pepper.

Cook the macaroni in the boiling salted water, drain in a strainer, and pour cold water over it to prevent the pieces from adhering to each other. Make a sauce out of the flour, milk, and cheese. Put the sauce and macaroni in alternate layers in a buttered baking dish, cover with buttered crumbs, and heat in oven until crumbs are brown.

### MACARONI AND CHEESE NO. 2

A good way to prepare macaroni and cheese is to make a rich cheese sauce and heat the macaroni in it. The mixture is usually covered with buttered crumbs and browned in the oven. The advantage of this way of preparing the dish, however, is that it is unnecessary to have a hot oven, as the sauce and macaroni may be reheated on the top of the stove.

### MACARONI WITH CHEESE AND TOMATO SAUCE

Boiled macaroni may be heated in tomato sauce and sprinkled with grated cheese just before serving.

### ITALIAN MACARONI AND CHEESE

1 cupful of macaroni broken into small pieces.	2 cloves. $1\frac{1}{2}$ cupfuls of tomato sauce.
2 quarts of boiling salted water.	$\frac{1}{2}$ cupful or more of grated cheese.
$\frac{1}{2}$ onion.	

Cook the macaroni in the boiling salted water, with the onion and cloves. Drain, remove the onion and cloves, reheat in tomato sauce, and serve with grated cheese.



## CHEESE AND MACARONI LOAF

- |  |  |
|--|--|
| $\frac{1}{2}$ cupful of macaroni broken into small pieces. | 1 teaspoonful each of chopped onion and parsley. |
| 1 cupful of milk.  | 3 eggs.  |
| 1 cupful of soft bread crumbs.                             | 1 teaspoonful of salt.                           |
| 1 tablespoonful of butter.                                 | $\frac{1}{2}$ cupful of grated cheese.           |
| 1 tablespoonful of chopped green pepper.                   |  |

Cook the macaroni in boiling salted water until tender, and rinse in cold water. Cook the parsley, onion, and pepper in a little water with the butter. Pour off the water or allow it to boil away. Beat the egg white and yolk separately. Mix all the ingredients, cutting and folding in the stiffly beaten whites at the last. Line a quart baking dish with buttered paper; turn the mixture into it; set the baking dish in a pan of hot water, and bake in a moderate oven from one-half to three-fourths of an hour. Serve with tomato sauce.

## BAKED RICE AND CHEESE NO. 1

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1 cupful of uncooked rice and | 2 tablespoonfuls of flour.         |
| 4 cupfuls of milk;            | $\frac{1}{2}$ pound of cheese.     |
| or,                           | $\frac{1}{2}$ teaspoonful of salt. |
| 3 cupfuls of cooked rice and  |                                    |
| 1 cupful of milk.             |                                    |

If uncooked rice is used, it should be cooked in 3 cupfuls of milk. Make a sauce with 1 cupful of milk, add the flour, cheese, and salt. Into a buttered baking dish put alternate layers of the cooked rice and the sauce. Cover with buttered crumbs and bake until the crumbs are brown. The proteids in this dish, made with rice cooked in milk, are equal to those of nearly  $1\frac{3}{4}$  pounds of average beef. If skimmed milk is used, the fuel value is equal to nearly  $3\frac{1}{2}$  pounds of beef. Whole milk raises the fuel value still higher. Estimated cost, 28 cents.

## BAKED RICE AND CHEESE NO. 2

- |  |                   |
|--|-------------------|
| $\frac{1}{4}$ pound of cheese grated or cut into small pieces. | 1 cupful of rice. |
|  | Milk as needed.   |

Cook the rice; put into a buttered baking dish alternate layers of rice and cheese; pour over them enough milk to come halfway to the top of the rice; cover with buttered crumbs and brown.

If the rice is cooked in milk either whole or skimmed and 1 cup of milk is used to pour over it, this dish has as much protein as  $1\frac{1}{4}$  pounds of beef of average composition, and a much higher fuel value.

### BAKED CRACKERS AND CHEESE NO. 1

9 or 10 butter crackers or Boston crackers.	$1\frac{1}{2}$ cupfuls of milk.
$\frac{1}{4}$ pound of cheese or 1 cupful of grated cheese.	$\frac{1}{4}$ teaspoonful of salt. Flour.

Split the crackers, if the thick sort are selected, or with a sharp knife cut them into pieces of uniform size. Pour the milk over them and drain it off at once. With the milk, flour, cheese, and salt, make a sauce. Into a buttered baking dish put alternate layers of the soaked crackers and sauce. Cover with bread crumbs and brown in the oven, or simply reheat without covering with crumbs.

The above is a very satisfactory substitute for macaroni and cheese, and can be prepared in less time.

### BAKED CRACKERS AND CHEESE NO. 2

9 or 10 butter crackers or soda crackers.	1 cupful of grated cheese.
2 cupfuls of hot milk, whole or skimmed.	$\frac{1}{4}$ teaspoonful of salt.

This is more quickly prepared than the preceding recipe, but as the milk is likely to curdle, it has not so good a consistency.

Soak the crackers in the milk; place them in a buttered baking dish in alternate layers with the cheese; pour the remaining milk over them and bake. This dish may be covered with buttered crumbs. Variety may be secured, in either this recipe or the preceding one, by putting a very small amount of mixed mustard on each cracker.

## CHEESE ROLLS

A large variety of rolls may be made by combining legumes, either beans of various kinds, cowpeas, lentils, or peas, with cheese of various kinds, and adding bread crumbs to make the mixture thick enough to form into a roll. Beans are usually mashed, but peas or small Lima beans may be combined whole with bread crumbs and grated cheese, and enough of the liquor in which the vegetables have been cooked may be added to get the right consistency. Or, instead of beans or peas, chopped spinach, beet tops, or head lettuce may be used. Homemade cottage cheese, and the soft cream cheese of commerce, standard cheese, or English dairy may be used.

## BOSTON ROAST

- |                                       |               |
|---------------------------------------|---------------|
| 1 pound can of kidney beans or        | Bread crumbs. |
| equivalent quantity of cooked         | Salt.         |
| beans.                                |               |
| $\frac{1}{2}$ pound of grated cheese. |               |

Mash the beans or put them through a meat grinder. Add the cheese and sufficient bread crumbs to make the mixture stiff enough to be formed into a roll. Bake in a moderate oven, basting occasionally with butter and water. Serve with tomato sauce. This dish may be flavored with onions, chopped and cooked in butter and water.

## PIMENTO AND CHEESE ROAST

- |   |                            |
|---|----------------------------|
| 2 cupfuls of cooked Lima beans.           | 3 canned pimentos chopped. |
| $\frac{1}{4}$ pound of cream cheese, com- | Bread crumbs.              |
| mercial or homemade.                      |                            |

Put the first three ingredients through a meat chopper. Mix thoroughly and add bread crumbs until it is stiff enough to form into a roll. Brown in the oven, basting occasionally with butter and water.



## NUT AND CHEESE ROAST

- |                                      |                               |
|--------------------------------------|-------------------------------|
| 1 cupful of grated cheese.           | 1 tablespoonful of butter.    |
| 1 cupful of chopped English walnuts. | Juice of $\frac{1}{2}$ lemon. |
| 1 cupful of bread crumbs.            | Salt and pepper.              |
| 2 tablespoonfuls of chopped onion.   |                               |

Cook the onion in the butter and a little water until it is tender. Mix the other ingredients and moisten with water, using the water in which the onion has been cooked. Pour into a shallow baking dish and brown in the oven.

## CHEESE AND SPINACH ROLL

- |                            |               |
|----------------------------|---------------|
| 2 quarts of spinach.       | Salt.         |
| 1 cupful of grated cheese. | Bread crumbs. |
| 1 tablespoonful of butter. |               |

Cook the spinach in water for 10 minutes. Drain off the water, add the butter, cook until tender, and chop. Add the grated cheese and then bread crumbs enough to make a mixture sufficiently stiff to form into a roll, or leave more moist and cook in a baking dish.

## VEGETABLE AND CHEESE ROLLS

For the spinach of the above recipe there may be substituted beet tops, Swiss chard, or the outer leaves of lettuce.

## CHEESE USED IN THE STUFFING OF MEAT

The mixtures in the preceding two recipes may be used for stuffing veal or beef. Eggs may be added if desired, and chopped onions or parsley may be cooked with the greens. In Italy roasts thus prepared are sprinkled with a little finely chopped garlic, and covered with celery tops and thin slices of bacon or fat pork before roasting.

## CREAMED CHEESE AND EGGS

3 hard-boiled eggs.	Speck of Cayenne.
1 tablespoonful of flour.	$\frac{1}{4}$ cupful or 1 ounce grated
1 cupful of milk.	cheese.
$\frac{1}{2}$ teaspoonful of salt.	4 slices of toast.

Make a thin white sauce with the flour and milk and seasonings. Add the cheese and stir until melted. Chop the whites and add them to the sauce. Pour the sauce over the toast, force the yolks through a potato ricer or strainer, sprinkle over the toast.

## BAKED EGGS WITH CHEESE

4 eggs.	$\frac{1}{4}$ teaspoonful salt.
1 cupful, or 4 ounces, of grated cheese.	A few grains of Cayenne pepper.
1 cupful of fine, soft, stale bread crumbs.	

Break the eggs into a buttered baking dish or into ramekins and cook them in a hot oven until they begin to turn white around the edge. Cover with the mixture of crumbs, cheese, and seasonings. Brown in a very hot oven. In preparing this dish it is essential that the oven be very hot or the eggs will be too much cooked by the time the cheese is brown. To avoid this, some cooks cover the eggs with white sauce before adding crumbs.

The food value of the dish is very close to that of a pound of beef of average composition. The estimated cost is about 14 cents.

For those who are particularly fond of cheese the amount of cheese in this recipe may be very much increased, thus making a much more nourishing dish. Or the amount may be reduced so as to give hardly more than a suggestion of the flavor of cheese.

## SCRAMBLED EGGS WITH CHEESE

$\frac{1}{2}$ pound of cheese grated or cut into small pieces.	1 tablespoonful of chopped parsley.
8 eggs.	A pinch of nutmeg.
	$\frac{1}{2}$ teaspoonful of salt.

Beat the eggs slightly, mix them with the other ingredients, and cook over a very slow fire, stirring constantly, so that the cheese may be melted by the time the eggs are cooked. In food value the dish is equal to nearly 2 pounds of average beef. The calculated cost is about 30 cents.

### SWISS EGGS

4 eggs.	Salt and pepper.
$\frac{1}{2}$ cupful of cream.	$\frac{1}{4}$ cupful of grated cheese.
1 tablespoonful of butter.	

Heat the butter and cream together, break in the eggs whole, sprinkle with salt and pepper. When nearly done, add the cheese. Serve on buttered toast. Strain the cream over the toast.

### CHEESE OMELET NO. 1

Cheese may be introduced into omelets in several ways. An ordinary omelet may be served with thin cheese sauce made in the following proportions:

$1\frac{1}{2}$ tablespoonfuls of flour.
$\frac{1}{4}$ cupful of grated cheese.
1 cupful of milk.

This sauce may also be added to omelets in which boiled rice, minced meat, or some other nutritious material has been included.

### CHEESE OMELET NO. 2

Grated cheese may be sprinkled over an ordinary omelet before it is served.

### CHEESE OMELET NO. 3

Yolks of 2 eggs.	Salt and pepper.
2 tablespoonfuls of hot water.	Whites of 4 eggs.
1 cupful of grated cheese.	1 tablespoonful of butter.

Beat the yolks until lemon colored and add the hot water and the seasoning. Beat the whites until they are stiff, and add the cheese. Cut and fold the two mixtures together. Heat the butter in omelet pan and cook the mixture very slowly until it is brown on the underside. If possible, cook the top of the omelet in the oven or by means of a hot plate held over it.



## BREAKFAST CEREALS WITH CHEESE

That cheese combined with cereal foods makes a rational dish, as regards the proportion of nutrients it supplies, has been pointed out on another page. Cheese and some of the crisp "ready to serve" cereal breakfast foods are a combination which is common, the cheese being melted with the cereal food, or simply served with it.

There are many who relish a piece of cheese with the cooked cereal so commonly eaten for breakfast and find such a combination satisfying to appetite and taste. Oatmeal or some other home-cooked breakfast cereal, prepared with cheese, is palatable, and such dishes have an advantage in that they may be served without cream and sugar. Since such a dish contains considerably more protein than the breakfast cereals as ordinarily served, it has a further advantage in that it may well serve as the principal item of a breakfast menu, instead of a preliminary to other courses. Such a combination as cereals cooked with cheese, toast, fruit, and tea, coffee, or chocolate, makes a palatable as well as nutritious breakfast and one which does not require much work to prepare and to clear away. A recipe for preparing oatmeal with cheese follows. Wheat breakfast foods, either parched or unparched, corn meal, and hominy may be prepared in the same way.

## OATMEAL WITH CHEESE

2 cupfuls of oatmeal.	1 tablespoonful of butter.
1 cupful of grated cheese.	1 level teaspoonful of salt.

Cook the oatmeal as usual. Shortly before serving, stir in the butter and add the cheese, and stir until the cheese is melted and thoroughly blended with the cereal.

The cheese should be mild in flavor and soft in texture. The proportion of cheese used may be increased if a more pronounced cheese flavor is desired.

## CHEESE WITH MUSH

Cheese may be added to corn-meal mush or to mush made from any of the corn or wheat preparations now on the market. The addition of cheese to corn-meal mush is particularly desirable when the mush is to be fried.

## FRIED BREAD WITH CHEESE NO. 1

6 slices of bread.	$\frac{1}{2}$ teaspoonful of salt.
1 cupful of milk.	$\frac{1}{2}$ teaspoonful of potassium
2 ounces of cheese, or $\frac{1}{2}$ cupful	bicarbonate.
of grated cheese.	Butter or other fat for frying.

Scald the milk with potassium bicarbonate; add the grated cheese, and stir until it dissolves. Dip the bread in this mixture and fry it in the butter. The potassium bicarbonate helps to keep the cheese in solution. It is desirable, however, to keep the milk hot while the bread is being dipped.

## FRIED BREAD WITH CHEESE NO. 2

Cut stale bread into thin pieces. Put two pieces together with grated cheese between them; dip into a mixture of egg and milk and fry in butter or other fat.

## ROMAN GNOCCHI

$\frac{1}{4}$ cupful of butter.	2 egg yolks.
$\frac{1}{4}$ cupful of flour.	$\frac{3}{4}$ cupful of grated cheese.
$\frac{1}{4}$ cupful of cornstarch.	Salt.
2 cupfuls of milk.	

Melt the butter; cook the cornstarch thoroughly, and then the flour in the butter; add the milk gradually; cook 3 minutes, stirring constantly; add the yolks and  $\frac{1}{2}$  cupful of the cheese. Pour into a buttered shallow pan and cool. Cut into squares; place them on a platter a little distance apart; sprinkle with remaining cheese, and brown in the oven.

The proteid value is that of  $\frac{3}{4}$  pound of average beef, the fuel value that of  $1\frac{3}{4}$  pounds. Calculated cost, 17 cents.

## CHEESE SOUFFLÉ

2 tablespoonfuls of butter.	A speck of Cayenne.
3 tablespoonfuls of flour.	$\frac{1}{4}$ cupful of grated cheese.
$\frac{1}{2}$ cupful of milk (scalded).	3 eggs.
$\frac{1}{2}$ teaspoonful of salt.	

Melt the butter; add the flour and, when well mixed, add gradually the scalded milk. Then add salt, Cayenne, and cheese.

Remove from the fire and add the yolks of the eggs, beaten until lemon colored. Cool the mixture and fold into it the whites of the eggs, beaten until stiff. Pour into a buttered baking dish and cook 20 minutes in a slow oven. Serve at once.

The proteid of this recipe is equal to that of  $\frac{1}{2}$  pound of beef; the fuel value is equal to that of  $\frac{3}{4}$  pound.

### CHEESE SOUFFLÉ WITH PASTRY

2 eggs.	$\frac{1}{2}$ cupful of Swiss cheese cut
$\frac{2}{3}$ cupful of thin cream.	into small pieces.
1 cupful of grated cheese.	Salt, Cayenne pepper, and
	nutmeg.

Add the eggs to the cream and beat slightly, then add the cheese and seasoning. Bake 15 minutes in a hot oven, in patty tins lined with puff paste.

### CHEESE CROQUETTES

3 tablespoonfuls of butter.	1 cupful of cheese cut in very
$\frac{1}{4}$ cupful of flour.	small pieces.
$\frac{2}{3}$ cupful of milk.	$\frac{1}{2}$ cupful grated cheese.
Yolks of 2 eggs.	Salt and pepper.

Make with a white sauce, using the butter, flour, and the milk. Add the unbeaten yolks and stir until well mixed, then add the grated cheese. As soon as the cheese melts, remove from the fire, fold in the pieces of cheese, and add the seasoning. Spread in a shallow pan and cool. Cut into squares or strips, cover with an egg and crumb mixture, and fry in deep fat.

### FRIED CHEESE BALLS

$1\frac{1}{2}$ cupfuls of grated cheese.	The whites of 3 eggs.
1 tablespoonful of flour.	Salt, pepper, cracker dust.

Beat the whites of the eggs; add the other ingredients; make into balls and roll in cracker dust. If the amount of flour is doubled, the mixture may be dropped from a spoon and fried without being rolled in crumbs.



## Cheese Soups and Vegetables Cooked with Cheese

In these dishes the cheese is used not only to add nutritive value, but also to give its characteristic flavor either to materials otherwise rather mild in taste (as in potatoes with cheese) or to combine its flavor with that of some more highly flavored vegetables (as in cheese and vegetable soup). The ingenious housekeeper whose family is fond of cheese can doubtless think of many desirable ways of making such combinations besides those given in the following recipes:

### MILK AND CHEESE SOUP

3 cupfuls of milk, or part milk and part stock.	1 cupful of grated cheese. Salt and paprika.
1½ tablespoonfuls of flour.	

Thicken the milk with the flour, cooking thoroughly. This is best done in a double boiler, with frequent stirrings. When ready to serve, add the cheese and the seasoning.

The proteids in this soup are equal in amount to those in  $\frac{5}{8}$  pound of beef of average composition; its fuel value is higher than that of a pound of beef.

### CHEESE AND VEGETABLE SOUP

2 cupfuls of stock.	2 tablespoonfuls of butter.
2 tablespoonfuls of finely chopped carrots:	2 tablespoonfuls of flour.
1 tablespoonful of chopped onion.	1½ teaspoonfuls of salt.
	1 cupful of scalded milk.
	¼ cupful of grated cheese.

A very little mace.

Cook the vegetables a short time in one-half of the butter, add the stock and the mace, boiling 15 or 20 minutes. Strain and add the milk. Thicken with flour cooked in the remaining butter. Just before serving, stir in the cheese and cook until it is melted.

## SCALLOPED POTATOES WITH CHEESE NO. 1

Put into a buttered baking dish alternate layers of cheese sauce No. 1 and cold boiled potatoes, sliced or cut into dice. Cover with buttered crumbs and bake.

## SCALLOPED POTATOES WITH CHEESE NO. 2

Put into a buttered baking dish alternate layers of white sauce and cold boiled potatoes, either sliced or cut into dice. Put over the top a layer of grated cheese and then a layer of buttered bread crumbs. Brown in the oven.

## SCALLOPED CABBAGE OR CAULIFLOWER WITH CHEESE

Cauliflower or cabbage may be scalloped according to either of the recipes given for scalloped potatoes and cheese. Sometimes a cauliflower is boiled whole, spread with grated cheese, then with buttered bread crumbs. It is browned in the oven and served with white sauce poured around it.

## CHEESE WITH POTATO PUFFS

1 cupful of mashed potatoes.	$\frac{1}{2}$ teaspoonful of salt.
$\frac{1}{4}$ cupful of milk.	$\frac{1}{2}$ cupful of grated cheese.
1 egg.	

Beat the potatoes and milk together until thoroughly mixed. Add the egg and the salt and beat throughly. Finally add the cheese. Bake in muffin tins in a slow oven 10 or 15 minutes.

A similar dish may be made by scooping out the inside of a baked potato and mixing it with cheese as above. Fill the potato-skin shell with the mixture, return to the oven, and bake until light brown.

## POTATOES WITH CHEESE SAUCE

Cut boiled potatoes into cubes and serve with cheese sauce No. 1. This is one of the cheese and vegetable dishes most frequently found on restaurant menus.

## Cheese Salads, Sandwiches, and Similar Cheese Dishes

Cheese of one sort or another is a very common accompaniment of salads, and the combination is rational as well as palatable, for the constituents of the succulent foods—chiefly water and cellulose—supplement the protein and fat of the cheese. Cheese is often used also as a part of the salad.

A number of recipes are given below for cheese salads and other cheese dishes which may be served with dinner or other regular meals, or served as part of a special lunch or special supper. Many of the cheese dishes discussed in other sections are also commonly used for such occasions when something savory is desired which can be easily and quickly prepared.

### CHEESE WITH SALADS

Cheese or cheese dishes are an acceptable addition to salads. Neufchâtel or other cream cheese, either plain or mixed with pimentos and olives, may be passed with lettuce or may be cut into slices and served on lettuce.

Cheese balls are often served with salad. They are made of some soft cream cheese, and are frequently combined with chopped chives, olives, sweet peppers, chopped nuts, etc., for the sake of adding flavor. Cooked egg yolk, spinach extract, etc., are sometimes mixed in for the sake of color. If the balls are rolled in chopped chives or parsley, both flavor and color are supplied.

### PLAIN CHEESE SALAD

Cut Edam or ordinary American cheese into thin pieces, scatter them over lettuce leaves, and serve with French dressing.

### OLIVE OR PIMENTO SANDWICH OR SALAD CHEESE

Mash any of the soft cream cheeses, and add chopped olives and pimentos in equal parts. This mixture requires much salt to make it palatable to most palates, the amount depending



chiefly on the quantity of pimento used. The mixture may be spread between thin slices of bread or it may be made into a roll or molded, cut into slices, and served on lettuce leaves with French dressing.

### CHEESE AND TOMATO SALAD

Stuff cold tomatoes with cream cheese and serve on lettuce leaves with French dressing.

### CHEESE AND PIMENTO SALAD

Stuff canned pimentos with cream cheese, cut into slices, and serve one or two slices to each person on lettuce leaves with French dressing.

### CHEESE JELLY SALAD

$\frac{1}{4}$ cupful of grated cheese.	1 cupful of whipped cream.
1 tablespoonful of gelatin.	Salt and pepper to taste.

Mix the cheese with the whipped cream, season to taste with salt and pepper, and add to the gelatin dissolved in a scant cupful of water. This may be molded in a large mold or in small molds.

When the jelly begins to harden, cover with grated cheese. The jelly should be served on a lettuce leaf, preferably with a cream dressing or a French dressing to which a little grated cheese has been added.

### CHEESE SALAD AND PRESERVES

Epicures have devised a dish which consists of lettuce with French dressing served with cream cheese and thick preparations of currants or other fruits preserved in honey or sugar, which, owing to the fact that the seeds have been extracted by a laborious process, are fairly expensive. The soft cheese often found in market is also relatively expensive. There is a suggestion in this dish, however, for others which are much less costly. Buttermilk cream, or ordinary cottage cheese served with lettuce or other green salad and a small amount of rich homemade preserves, is a combination with much the same character, and also very appetizing.

## DEVILED EGGS WITH CHEESE

In making deviled eggs, either to be eaten alone or upon lettuce leaves in the form of salad, a little grated cheese may be mixed with the yolks in addition to the usual salad dressing and flavorings with which the yolks are mixed.

## CHEESE AND CELERY

Cut stalks of celery having deep grooves in them into pieces about 2 inches long. Fill the grooves with cream cheese salted or flavored with chopped pimentos, and serve with bread and butter as a salad course or serve as a relish at the beginning of a meal.

Although not cheese dishes, strictly speaking, the following salad dressings made with buttermilk cream (see p. 568) may be included in this section.

## BUTTERMILK CREAM SALAD DRESSING

$\frac{1}{2}$ cupful of buttermilk cream.	$\frac{1}{4}$ teaspoonful of salt.
1 tablespoonful of vinegar.	Cayenne pepper.

This dressing is particularly suitable for serving with cucumbers.

## BUTTERMILK CREAM HORSE-RADISH SALAD DRESSING

To buttermilk cream add a little grated horse-radish and vinegar and salt. Serve on whole or sliced tomatoes.

## CHEESE SANDWICHES

Mash or grate American cheese, add salt, a few drops of vinegar and paprika, and a speck of mustard. Mix thoroughly and spread between thin slices of bread.

## CHEESE AND ANCHOVY SANDWICHES

To the mixture mentioned in the preceding recipe, add a little anchovy essence. Sardines mashed or rubbed into a paste, or any other fish paste, may be used in a similar way.

### PIMENTO, OLIVE, AND CHEESE SANDWICHES

These sandwiches have already been described.

### CUBAN SANDWICHES

This sandwich may be described as a kind of club sandwich with cheese. It is usually made large, so that it is necessary to eat it with a knife and fork. It may be made in such proportions as to supply a large amount of nourishment.

Cut the crusts from slices of bread. Between two slices lay first lettuce with a little salad dressing or salt on it, then a slice of soft mild cheese and finally thin slices of dill pickles or a little chopped pickle.

### TOASTED CHEESE SANDWICHES

Plain bread and butter sandwiches with fairly thick slices of cheese put between the slices are frequently toasted, and on picnics, or at chafing-dish suppers, are often browned in a pan in which bacon has just been fried.

### Cheese Pastry, Cheese Sweets, and Similar Dishes

In the foregoing pages a large number of recipes have been included in which cheese is combined with materials, without cooking, as in salads, or used in cooked dishes of creamy or custard-like consistency, as in soufflés and Welsh rabbit, or used in combination with vegetables or cereals, such as rice.

There are a number of cheese dishes of quite different character in which the cheese is combined with dough, batter, or pastry in various ways, and a number of dishes in which cheese or cheese curd is used in combinations suitable for dessert. Such sweet dishes were once much more common than they are to-day, as reference to old cookery books will show, but some of them are well worth retaining.



In cheese sweets, flavor and richness are both contributed by the cheese.

When cheese is used in pastry or dough it may serve simply as a flavor, as in cheese sticks or cheese straws, or it may wholly or in part replace with its fat the usual shortening, as butter or other fat, and with its protein (casein) the protein (albumen) of eggs. As an illustration of such a use of cheese, cheese gingerbread may be cited.

Using cheese in this way is often an economy when eggs are scarce. Better results will be obtained if soft cheese is used which can be worked into the dough in much the same way as butter or other shortening. To those who like cheese the flavor which it imparts would be an advantage. However, if a very mild cheese is used in combination with molasses or spice the dish differs a little in flavor from one prepared in the usual way.

### Cheese Pastries and Similar Dishes

#### CHEESE BISCUIT NO. 1

2 cupfuls of flour.	$\frac{1}{4}$ teaspoonful of salt.
4 teaspoonfuls of baking powder.	Grated cheese sufficient to
2 tablespoonfuls of lard or butter.	give desired flavor.
$\frac{7}{8}$ of a cup of milk.	

Mix all the ingredients excepting the cheese, as for baking powder biscuits. Roll thin, divide into two parts, sprinkle one half with grated cheese, lay the other half of the dough over the cheese, cut out with a small cutter, and bake.

#### CHEESE BISCUIT NO. 2

$\frac{1}{4}$ pound of soft cheese.	4 teaspoonfuls of baking
2 cupfuls of flour.	powder.
1 cupful of water.	$1\frac{1}{2}$ teaspoonfuls of salt.

Mix and sift the dry ingredients, then work in the cheese with a fork or with the fingers, and add the water gradually. The approximate amount of water has been given; it is impossible to give the exact amount, as flour differs in its capacity for taking up moisture. Toss the dough on a floured board and roll out and cut with a biscuit cutter. Place in a buttered pan and bake in a quick oven from 12 to 15 minutes. The biscuit may be sprinkled with cheese before being put into the oven.

If the cheese is sufficiently soft it can be measured just as butter is. This recipe, then, would call for  $\frac{1}{2}$  cupful.

### CHEESE DROPS

2½ tablespoonfuls of milk.	1 egg.
1 teaspoonful of butter.	2 tablespoonfuls of grated
1¼ cupfuls of flour.	Parmesan cheese or dry
⅛ teaspoonful of salt.	American cheese.

Heat the butter and milk to boiling point, add the flour and the salt and stir thoroughly. Remove from the fire, add the egg and cheese and stir until well mixed. When cold, drop in small pieces in deep fat and brown. This makes a good addition to any clear soup or to consommé.

### CHEESE WAFERS

Spread grated cheese on thin crackers, heat in the oven until the cheese is melted. Serve with soup or salad.

### CHEESE RELISH

Spread bread which has been toasted, or fried in deep fat, with grated cheese, or with grated cheese mixed with a little mustard, then heat in the oven until the cheese is melted. This may be served with salad, or as a relish to give flavor to some dish such as boiled rice or hominy, which has no very marked flavor.

### CHEESE STRAWS

Roll out plain or puff paste, until one-fourth of an inch thick. Spread one-half of it with grated cheese. Fold over the other half and roll out again. Repeat the process three or four times. Cut into strips and bake. Serve with soup or salad.

## SALAD BISCUIT

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| $\frac{1}{2}$ pound of cheese.   | $1\frac{1}{2}$ teaspoonfuls of salt. |
| 2 cupfuls of flour.              | 1 cupful of water.                   |
| 4 teaspoonfuls of baking powder. |                                      |

Mix as for cheese biscuits No. 1 or No. 2, depending on whether the cheese is hard or soft.

## CHEESE GINGERBREAD NO. 1

- |                                |                                 |
|--------------------------------|---------------------------------|
| 1 cupful of molasses.          | 2 cupfuls of flour.             |
| 4 ounces of cheese.            | 2 teaspoonfuls of ginger.       |
| 1 teaspoonful of soda.         | $\frac{1}{2}$ teaspoonful salt. |
| $\frac{1}{2}$ cupful of water. |                                 |

Heat the molasses and the cheese in a double boiler until the cheese is melted. Add the soda and stir vigorously. Mix and sift dry ingredients and add them to the molasses and cheese alternately with the water. Bake 15 minutes in small buttered tins.

## CHEESE GINGERBREAD NO. 2

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| $\frac{1}{2}$ cupful of molasses. | 1 teaspoonful of soda.             |
| $\frac{1}{2}$ cupful of sugar.    | 2 teaspoonfuls of ginger.          |
| 4 ounces of cheese.               | $\frac{1}{2}$ teaspoonful of salt. |
| 2 cupfuls of flour.               | $\frac{3}{4}$ cupful of water.     |

Rub the cheese and sugar together. Add the molasses. Mix and sift the dry ingredients and add them to the cheese mixture alternately with the water.

## CHEESE CUSTARD

- |   |                                 |
|---|---------------------------------|
| 1 cupful of grated cheese.                  | Yolks of 2 eggs.                |
| $\frac{1}{2}$ cupful of cream or rich milk. | A speck of salt and of paprika. |

Mix the cream and the cheese, and heat until the cheese is melted. Remove from the fire and add the yolks of the eggs. Bake in paper cases or buttered ramekins. Serve with jelly or preserves.



## CHEESE CAKES

1 quart of milk.  
Rennet.  
1 ounce of sugar.  
Yolks of 2 eggs.

A speck of nutmeg.  
 $1\frac{1}{2}$  ounces of butter.  
1 ounce of dried currants or  
small raisins.

Warm the milk and add the rennet, using the amount prescribed on the package. Let the milk stand until the curd forms, then break up the curd and strain off the whey. Add the other ingredients to the curd; line patty tins with pastry, fill them with the mixture, and bake.

## BROWN BETTY WITH CHEESE

Arrange in a deep earthenware baking dish, alternate layers of bread crumbs and thinly sliced apples. Season with cinnamon, also a little clove if desired, and brown sugar. Scatter some finely-shaved, mild full-cream cheese over each layer of apple. When the dish is full, scatter bread crumbs over the top and bake 30 to 45 minutes, placing the dish in a pan of water so that the pudding will not burn.

If preferred, this may be sweetened with molasses mixed with an equal amount of hot water and poured over the top, a half cupful of molasses being sufficient for a quart pudding dish full.

Cheese may be used in place of butter in a similar way in other apple puddings. Apple pie made with a layer of finely-shaved cheese over the seasoned apple; and baked in the usual way, is liked by many who are fond of cheese served with apple pie.

## Conclusion

In the foregoing pages information has been summarized regarding the food value of cheese, an important agricultural product, and ways of preparing it for the table. It has been pointed out that, judged by the kind of nutrients it supplies—chiefly nitrogenous material and fat—and the proportion in which they are present, it resembles such foodstuffs as meat, fish, and eggs, which means that like them its rational use

in the diet is in combination with other staple foods, to form well-balanced meals.

Experiments have shown that when eaten either raw or carefully cooked, cheese is as thoroughly digested as other staple foods and is not likely to produce physiological disturbance.

An ounce of cheese is, roughly speaking, equivalent to 1 egg, to a glass of milk, or to 2 ounces of meat.

Although uncooked cheese resembles meat in composition, cheese dishes prepared after ordinary recipes, with milk and shortening, are likely to contain more fat than meat dishes prepared in the usual ways. When, therefore, such cheese dishes are served with other staple foods the combination is likely to contain more fat than the usual meal. If little fat is ordinarily used, this may be an advantage. If a great deal of fat is ordinarily used, it may be desirable to lessen the amount in the cheese dishes. This can readily be done by omitting the shortening and using skim milk or water in the preparation of such dishes, a change which also lessens their cost.

The fact that cheese, like meat, contains neither starch nor cellulose suggests that, like meat, it should be combined with bread, potatoes, and other starchy foods, with vegetables and with sweets. The concentrated character of cheese and many cheese dishes suggests the use of succulent fruits and vegetables with them. The high percentage of fat in cheese suggests the use of correspondingly small amounts of fat in the accompanying dishes, while the soft texture of cheese dishes as compared with meat makes it reasonable to serve the harder and crustier breads with them.

When cheese is not used as the chief nitrogenous food of a meal it may be introduced into bills of fare

in many incidental ways, and thus add materially to that portion of the diet needed for building and repairing body tissue.

Though cheese is so generally used in some way in most families, yet the making of menus with cheese as a central dish is less well understood than more usual food combinations, since there is less experience to serve as a guide. More thought is therefore usually required to arrange such cheese meals, in order that they may be palatable and at the same time reasonable in nutritive value.

In order that the diet may remain well balanced, cheese, if used in quantity, should replace foods of similar composition rather than supplement them. The builder who has a choice of materials must have a knowledge of their relative properties if he wishes to use stone instead of brick, or wood in place of iron. It is the same with the housekeeper who wishes to use her available food supply intelligently, and whose choice of foods is influenced by their relative cost at a given time or season. The woman who has a knowledge of the relative food value of different articles of diet, and their real food qualities as distinguished from their market value, who understands good methods of cooking and serving foods, and who plans her meals and other housework so that unnecessary labor and expense may be avoided, is taking account of the things which make for economical living as well as for good living.

Dishes which are liked and the methods followed in preparing them will vary in different countries and at different times, yet this does not of necessity mean that the nutritive value of the diet varies correspondingly. In the same way it is possible for us to vary the



selection of our foods and the character of our diet at will, according to the demands of our taste and our purpose, without correspondingly changing its value for supplying the needs of the body. This means that the housekeeper, in suitable ways, can use cheese, meat, fish, eggs, and other foods of similar composition as substitutes for one another, being governed by their relative market value at different times and seasons, by the tastes of her family, and similar considerations. If she uses the different foodstuffs with reference to their nutritive value, and is skillful in preparing foods in appetizing ways and in serving them in attractive combinations, the daily fare may be both adequate and pleasing, whether she selects cheese or meat or fish or eggs or other foods to supply nitrogenous material and fat. Here, as in all that pertains to housekeeping, true economy is dependent upon a knowledge of materials and skill in using them.

U. S. DEPARTMENT OF AGRICULTURE  
FARMERS' BULLETIN NO. 653

---

HONEY AND ITS USES IN THE HOME

CAROLINE L. HUNT

Expert in Nutrition

and

HELEN W. ATWATER

Assistant in Nutrition, Office of Experiment Stations

---

*Contribution from the Office of Experiment Stations*  
A. C. TRUE, Director

---

INTRODUCTION

In the days before trade with the Tropics introduced cane sugar into temperate regions, honey was by far the most common sweet substance available for human food. In very early times men discovered that the material deposited by honeybees in hollow trees and in the crevices of rocks was a valuable and agreeable food, and learned to appropriate it for their own use. Such wild honey is still gathered in Palestine and in the less advanced parts of Africa, in Asia, and in South

NOTE.—This bulletin is of interest to housekeepers throughout the country.

and Central America, that from Peru making an important article of export. Bee trees, which were considered a prize in pioneer times in this country, are still valued in some remote rural regions, and not infrequently people living in country or village take the comb from a colony of bees which has settled in a corner under the weatherboarding of a building or some similar place.

The naturally built combs are of course very irregular, and this fact, combined with the difficulty of driving the bees out, is likely to cause great loss of honey and to injure the colony. The idea of getting bees to build their combs in some special and convenient place of man's providing—that is, in a hive—seems to have occurred very long ago to people everywhere, and the custom of “keeping” bees instead of seeking out their haunts was the first step toward securing a better and more economical supply of honey. Beekeeping is now almost universal except in regions of extreme cold and among savage tribes.

The hive, once adopted, has undergone many changes, all of them intended to direct the activities of the bee to the service of man. Up to 60 or 70 years ago the hives most commonly in use among nations of European origin were the round and slightly pointed ones made of tightly braided straw or willow, which are known as skeps and which have become a generally recognized symbol of industry. In these the combs are built irregularly, and since they are fastened firmly to the top and sides they can not be handled separately. There is no provision for separating the brood cells, where the bees rear their young, from that extra supply of honey which they instinctively store in times



when the nectar flows freely and which is the only part that can be used as food for man. The destruction of the colony at the time of taking the honey was formerly a common practice.

The hives now most commonly used in this country are of the type invented by Langstroth in 1851. They consist of rectangular wooden boxes or chests from the sides of which, at a point near the top, removable frames for the combs are suspended. One or more supers or extra parts of the hive are kept on hand, so that new ones can from time to time be placed on the part of the hive used for brood rearing, and thus the amount of honey-storing space can be enlarged when the bees are most active in gathering nectar. The modern hives are sometimes supplied with queen excluders, which permit only the worker bees, which are smaller than the queen, to pass from the lower hive body into the place reserved for the surplus honey, thus preventing the rearing of brood in the supers. There is also an arrangement by which all of the bees can be trapped, and thus kept out of the supers when the honey is to be removed.

Not long after the introduction of Langstroth's hives gave an impetus to commercial beekeeping, a centrifugal honey extractor was invented, which greatly improved the method of removing honey from the comb. Formerly honey was strained from the combs, and such honey was a rather uncertain product and often contained various kinds of refuse, such as parts of dead bees, etc., which could not be easily removed. When the modern centrifugal machines are used, the wax caps which close the cells of the combs are cut off, and the uncapped combs are put into the extractor, which throws the liquid

honey out by centrifugal force and lets it run off at the bottom of the machine. Honey which has just been extracted may contain some pieces of wax capping and other impurities. Hence, extractors are usually provided with strainers which remove the larger particles as the honey passes out. The particles are lighter than honey. Honey is therefore usually allowed to stand until they rise to the top in scum, and the latter is removed before the honey is put into cans or bottles.

Because extracted honey is easily adulterated, the public was formerly rather suspicious of its purity. Recently, however, owing to pure-food legislation, to the watchfulness of the Bureau of Chemistry of the United States Department of Agriculture and State agencies charged with the carrying out of pure-food laws, and also to the efforts of honey producers, the practice of adulterating honey has become dangerous and unprofitable; confidence in the extracted article has been largely restored, and there is relatively little adulterated extracted honey on the market.

Although the greater part of the honey produced is now sold as extracted honey, there is still a good market for comb honey, and since appearance is an especially important feature in judging it, the producer takes special pains to have combs regular in shape and attractive in color. Comb honey cannot be adulterated except by processes which cost more than the retail price, and therefore the purchaser may be sure that comb honey is the product of the hive.

There are two kinds of natural honey, known as floral or normal, and honeydew or abnormal, the former being made from nectar, a sweet liquid secreted by flowers, and the latter from honeydew, a sweet substance deposited on the leaves of plants by plant

lice and other insects. Unless otherwise stated, the term "honey" when used in this bulletin may be understood to refer to the kind made from nectar, or to that in which the quantity of honeydew is so small that it does not greatly affect the character of the product.

The chief materials that the worker bees bring to the hive are nectar, pollen, and propolis. They collect the pollen on the hairs on their bodies, place it in the so-called pollen baskets on their legs, and thus carry it back to the hive to be deposited near the brood cells. This pollen is rich in nitrogenous material and is important as food for the young and developing bees (larvæ). A few grains usually find their way into the honey cells. Propolis or bee glue is obtained from the gums exuding from trees and shrubs. It is taken to the hive in the same way as pollen, and is used to make the hive waterproof and sometimes to strengthen the edges of the comb. If any gets on the capping of the honey it tends to spoil the appearance of the combs; these traces of propolis are known as "travel stain."

Nectar is the material from which honey is made. The bees suck it out of the flower with their long tongues and swallow it into the honey sac, where it undergoes some changes not yet well understood. It consists chiefly of sugar and water, the former constituting usually between one-fifth and two-fifths of the entire weight and the latter between three-fifths and four-fifths. With this substance are mixed small quantities of other materials, chiefly mineral matters, gums, and volatile bodies. To the latter the aroma and flavor of honey are chiefly due.

The changes by means of which nectar is transformed into the finished honey are technically known



as "ripening." They take place partly in the honey sac of the bee, and partly in the cells of the comb, continuing even after the latter have been capped with wax. They consist mainly in removal of a part of the water from the nectar, a task which the bees accomplish by warming the air of the hives and also by fanning the nectar in the cells, and in the change in the chemical nature of the sugars, which will be described later in this bulletin.

Wax is made in and secreted from special glands on the abdomen of the worker bee. Several pounds of honey are used in producing a pound of wax, and a high temperature must be kept up in the hive by the bees while it is being made. Because of the cost of wax secretion, beekeepers usually try to arrange that the bees shall have little comb building to do except when comb honey is being produced.

### Food Value of Honey

Like most foods, honey, although preserving its general character, varies more or less from the average composition. The variations are of interest to the housekeeper in so far as they may affect the food value or the way in which the honey can be used to the best advantage in cookery. They may also be of decided interest to the food inspector, as departures from the usual composition may help him to detect the presence of adulterants.

So far as its food value is concerned, honey may be roughly described as a sirup with a distinctive flavor and aroma, made up of 4 parts sugar to 1 part water. There are several kinds of sugars present in honey, including cane sugar (sucrose), grape sugar (dextrose),

and fruit sugar (levulose); the last two together being called invert sugar. Some dextrin is also present as well as a variety of other substances in very small amounts. Included among them are nitrogenous substances (protein) which occur in quantities too minute to affect the food value of honey for man. Some of the other substances present in minute quantity, namely volatile oils, or other bodies of pronounced odor or flavor from the nectar, are valuable because they influence the flavor and aroma of the honey.

According to data gathered by the Bureau of Chemistry <sup>1</sup> honey, on an average, contains in round numbers per hundred parts 18 parts water, 78 parts carbohydrates (including 76 parts sugar and 2 parts dextrin), 0.2 part mineral substance, or ash, and nearly 4 parts of undetermined substances such as pollen grain, gum, bee glue, formic acid and volatile oils, and other flavor substances. These are average values and there is, of course, considerable variation in individual honeys. For instance, the proportion of water varies from about one-eighth to one-fourth of the total weight of the honey, being influenced by the moisture in the air at the time the honey is produced and the dryness of the atmosphere in which the honey is kept afterwards. Samples of honey from conspicuously dry localities (the southwestern part of the United States, for instance) and honeys made in other localities in very dry weather have a relatively low water content.

The most abundant of the mineral substances in honey are magnesia, lime, phosphoric acid, and iron. Since honey contains less than 1 part per hundred of mineral matter, it is obvious that even if eaten

<sup>1</sup> U. S. Dept. Agr., Bur. Chem. Bul. 110.

in large amounts it could not contribute greatly to the total mineral matter of the diet. However, it is claimed that unless care is taken in selecting foods there is a possibility that the diet may contain too little lime, and for this reason it is worth noting that honey contains this constituent. In respect to its ash content it is more comparable with maple sirup than with cane sugar, for in cane sugar the mineral substances originally present in the plant juices have been removed during the process of refining.

The percentage of the different sugars varies more or less, but under any circumstance the amount of cane sugar is small (some 2 parts per hundred) and less than in the nectar from which the honey is made. The proportion of dextrose (grape sugar) and levulose (fruit sugar) making up the total invert sugar varies in honey as it does in the nectar from which it is made, but this is of no importance in planning meals. However, it is of practical importance for the reason that it determines the character and appearance of the honey. Honey will granulate easily if the proportion of dextrose is large, but this is not the case if levulose predominates. For example, alfalfa honey, which contains a high percentage of dextrose, often forms such a solid mass of crystals that it is sold in cakes. This may be an advantage sometimes. Thus, the solid alfalfa honey can be used for such purposes as filling for layer cakes, for which liquid honey would not be so suitable because it would run out. The proportion of dextrin present in normal or nectar honey is so small that it affects neither food nor cooking values. Abnormal or honeydew honey, however, contains so much dextrin that it requires special handling in cooking. This is a matter of interest to professional bakers rather than to house-



keepers, as such honey is not commonly used in the home.

Since the principal ingredient of honey is sugar, it is obvious that it should be classed with the fuel foods which supply the body with the energy it needs for the various tasks it performs, rather than those whose function is to build and repair the body—that is, the “tissue formers,” as they are sometimes called. If honey contained no water its energy value would be practically the same, pound for pound, as that of cane sugar. However, since about one-fifth of its total weight is water, it follows naturally that its energy value is one-fifth less than that of cane sugar, being 1,485 calories per pound.

In planning meals, particularly in hospitals, children's homes and other institutions where large quantities are required, it is often convenient to have some quick and fairly accurate method of estimating the relative value of different articles of diet which are used in similar ways. For this reason it is worth remembering that an ordinary tablespoonful of honey which weighs a trifle over an ounce will furnish the body 100 calories. The same amount of energy would be supplied by five-sixths of an ounce of sugar, by  $1\frac{1}{4}$  ounces of molasses, or by a little less than an ounce of preserves (such as orange marmalade).

### Flavor of Honey

The flavor and aroma of honey depend largely upon the blossoms from which the nectar is obtained. The nectar of each kind of flower contains a distinctive combination of oils and other substances which gives the blossoms their special fragrance, and these sub-

stances are retained in the honey made from the nectar. It is practically impossible to prevent bees from visiting more than one kind of flower during a given period, and, strictly speaking, almost every kind of honey is made from a mixture of different nectars. Nevertheless, when the hives are situated near a large supply of one sort of blossom, its nectar usually predominates and its flavor and aroma can be easily recognized in the honey. It is perfectly correct, therefore, to speak of basswood honey, fruit-blossom honey, buckwheat honey, etc.

Different localities naturally produce different kinds of honey, and different kinds may be produced in the same locality at different seasons, according to the kinds of flowers which abound. Several famous European honeys, among them the choice French variety from Narbonne, owe their characteristic aromatic flavor to wild thyme and other flowers of the mint family. In orange honey, from districts where orange blossoms abound, the peculiar aroma and flavor of the flowers are very clearly marked. Sage and clover honeys are well-known American varieties in which the characteristics of the nectar are easily and pleasantly recognized.

Choosing between honey from different flowers is mainly a matter of taste; and taste in honey, as in many other things, seems to depend more on what one has been accustomed to than on any real superiority. For example, it sometimes happens that a person who has always used buckwheat honey with its full-bodied, rather acid flavor, imagines that a mild, light honey with less of the characteristic "comby" taste must be adulterated, whereas a person who is familiar only with some such delicate honey as white clover or alfalfa,

may consider buckwheat very inferior, or even fancy that it is not genuine floral honey.

The relative abundance of different flowers, and consequently the flavor of the honey, vary so greatly in different seasons that beekeepers can not count on a regular yield of uniform honey, and their patrons may be disappointed to find that the honey of one year is different from that of the year before. To overcome this difficulty many of the best wholesale dealers have recently adopted the practice of mixing several honeys to produce a blend. This process is like that adopted long ago in the case of teas. To blend honeys so that the mixture will be generally acceptable requires a great deal of skill, but when the consumer has found a blend which pleases him, he is more likely to be able to get honey of that flavor season after season than if he depends on unmixed honeys.

### Wholesomeness

Because the chemical change effected by the bee in the sugars of the nectar is the same as that effected by digestive ferments, and the principal sugars may therefore be considered to have undergone the first step of digestion, honey is often said to contain predigested sugar, and to be more wholesome than cane sugar. There is no reason, however, to believe that the healthy human body is not equal to the task of digesting any sugar, so a special claim made for the wholesomeness of honey on this ground seems unimportant. It is generally believed that the energy from sugar is liberated for the use of the body more quickly than that from such other fuel foods as starch and fat. Hence it is said to delay the oncoming of fatigue during great



muscular exertion. For this reason some form of sweet is included in almost all army rations and is often used by persons undergoing severe physical exertion, such as mountaineers and athletes. Although no experiments have been made to test the value of honey in this respect, it seems safe to suppose that it would have the same good effect as other sweets.

Everyone knows that eating too much ordinary sugar upsets digestion. The differences in the effects of too much honey and too much cane sugar are rather complicated, but it is safe to say that eating too much of either should be avoided, even by healthy people.

For some persons suffering from serious digestive disturbances honey may be a safer form of sugar than cane sugar, but with other forms of indigestion the opposite is true; it depends upon the particular form of disturbance, and such matters should be decided by a skillful physician for each individual case. For persons of very delicate digestion the particles of wax in comb honey may cause trouble, as it is believed that the digestive processes do not have any effect on them. For normal persons, however, the wax should be as harmless as are the particles of indigestible material contained in many other wholesome foods.

Honey is sometimes said to have a mildly laxative effect, and the statement is doubtless true, as it is of many other materials, especially those of vegetable origin. If a person had to live on a very limited number of foods, especially if he had a tendency to constipation, it might be wise to use honey rather generally in preference to other forms of sweet; but the effect of such small amounts of honey as would be used in an ordinary diet would hardly be worth taking into consideration. Bran biscuits made with honey instead of sugar

would owe any advantage they might have over the ordinary bran biscuit to the laxative effect of the honey.

Other medicinal qualities have been claimed for honey, particularly in older writings, and it still finds use in medicinal preparations, but no doubt more because of tradition and of the flavor and texture it imparts than for actual medicinal properties. From the standpoint of the honey industry this is a matter of little importance, for honey is regarded by the vast majority of its users as a food and not as a drug product.

Even if honey has no such specific medicinal advantages, this does not in the least lessen its general value as a wholesome, useful foodstuff, well worthy of even more extended use than it already has, not only because it is agreeable and economical in itself, but also because it introduces a pleasing variety and thus makes the diet more appetizing, and consequently more wholesome.

Whether or not honey can be economically used in the diet as a source of nourishment depends of course upon its food value and its price as compared with other food for which it may be substituted. To compare food materials in these two respects is no easy task because, besides varying in price with time and place, they may differ widely in the kind and the quantity of the nutrients which they supply. If honey is compared with cane sugar at 7 cents a pound, on the basis of the energy which it provides for the body, it should sell for not more than 6 cents a pound in order to be as economical. Comparing it on the same basis with butter at 40 cents a pound, it is evident that it might sell for 17 cents a pound and be equally economical as a source of energy.

The difference between the wholesale prices of comb

honey and of extracted honey are much greater than those between the retail prices. A pound of extracted honey in a jar usually sells at retail for about the same as the average section of comb honey, which has a net weight of 14 ounces. On the other hand, the wholesale price of comb honey is usually about 50 per cent higher than that of extracted honey. The reason for this is that the producer of comb honey does far more of the work of getting his product ready for the final market than does the producer of extracted honey. As the sections leave his hands, so they are passed over the counter to the housewife or other retail purchaser. Extracted honey, on the contrary, is sold by the producer to the bottler, not in pound lots but in 5-gallon cans or barrels. The bottler does the work of blending, liquefying, bottling, labeling, and packing. It is possible, therefore, for the consumer to save money by buying extracted honey at wholesale and avoiding the cost of the various kinds of work which prepare it for the retail market.

Where only small quantities of honey are used, the effort to buy in the cheapest market may cost more in energy than it saves in money. Where, however, large supplies are bought, the purchaser should try to get into direct communication with the producer and take advantage of the parcels post as a means of transportation. The names of dealers in his vicinity can often be obtained from the beekeepers' magazines, or by writing to the State inspector of apiaries. The names of State inspectors and often those of local dealers can be obtained by addressing the Bureau of Entomology of the United States Department of Agriculture.

Now that extracted honey is usually pure and of good



quality, the advantage of comb honey lies chiefly in its attractiveness to the eye. Unless very great care is taken in extracting honey, some of the volatile bodies on which its flavor depends will probably be lost. Hence it often happens that the flavor of comb honey is really slightly superior to the same kind extracted. Many persons think that the presence of the wax gives the honey a more pleasant consistency for table use. Whether these advantages are worth the extra cost, each consumer must decide for himself.

Comb honey is commonly graded according to finish and color. It is described as Extra Fancy, Fancy, No. 1, or No. 2, according to the evenness with which the sections are filled, the freedom of the product from propolis or other stains, and the number of unsealed cells. It is graded according to color as white, light amber, amber, and dark. From the point of view of food value alone, finish and color are not of importance, though dark honeys are usually of stronger flavor.

In order to comply with the Federal Food and Drugs Act which applies to all goods shipped from one State to another, every section of honey and every package containing extracted honey must be marked with the net weight. In comb honey this is understood to be the weight of the comb and the honey, and to exclude the weight of the wooden frame.

In choosing honey, too much importance should not be attached to lightness of color, for some of the best varieties are dark; nor should granulation be thought to imply adulteration. The truth is that crystallization is more likely to occur in pure than in impure honeys, and some pure varieties, especially alfalfa honeys, granulate so easily that they are often sold to

the consumer in solid form. The crystals can easily be dissolved by heating the honey, which should be done in a double boiler or other kind of water bath. If the temperature does not go beyond 160° F., there is little danger that either color or flavor will be affected.

Unless in a sealed package, honey should be kept in a dry place; otherwise it is likely to absorb moisture and spoil, for when diluted it will ferment or sour readily, as will any other similar sugar sirup. Heat and dryness are usually found together in the household, and ordinarily the safest places for honey are the warmest places; the least desirable is the refrigerator.

### Uses of Honey

Honey is used both in its natural state and as an ingredient of cooked food. In this country it is more commonly used uncooked than cooked, and practically all comb honey is consumed in this way. Honey is much more commonly used in cookery in Europe than in America, though commercial bakers and confectioners in the United States use much larger quantities than many persons realize.

The simplest way of using honey is to serve it like jam or sirup with bread, breakfast cereals, boiled rice, pancakes, and other mild-flavored foods. As ordinarily used on bread, an ounce of honey "spreads" as many slices as an ounce of jam. When it is to be used in the place of sirup some people dilute it by mixing it with hot water, which has the effect of making it not only less sweet but also easier to pour.

Honey or a mixture of honey and sugar sirup can be satisfactorily used for sweetening lemonade and other fruit drinks. Sirup of any kind is more convenient

for this purpose than undissolved sugar, and when charged water is to be added it has a further advantage since it has less tendency to expel the gas. It is the custom of many housewives to keep a sirup for this purpose, particularly in hot weather, and variety can be secured by occasionally using honey.

Honey can be used in place of sugar for some kinds of preserving, and there is reason to believe that fruits cooked in it keep very well indeed. Bar-le-Duc currants, which form a very delicate and expensive article of commerce, are often made by cooking currants in honey. They are frequently served with cream cheese and crackers or some other form of bread. A satisfactory substitute may be secured by serving honey and tart fruit, either cooked or uncooked, with cottage cheese and bread and butter. Three ounces of cottage cheese curd, 2 ounces of bread,  $\frac{2}{3}$  ounce of butter (either added to the curd or spread on the bread), 2 ounces of honey, and 6 ounces of strawberries or other watery fruit would make a reasonably well-balanced meal. Sometimes honey alone is served with cream cheese. Crisp crackers, spread with cream cheese and honey, form a good combination from the point of view of nutritive value and taste. Honey may be substituted for sugar in baking apples.

### Honey in Cookery

When used in cookery, honey does not always produce the same effect as corresponding quantities of sugar or molasses, and the reasons for some of the differences between them are not well understood. Careful experiments with various types of honeys and honey recipes were therefore made in the nutrition



laboratory of the United States Department of Agriculture, in the hope of explaining such points. Most of the facts stated in the following paragraphs were obtained in this way, and all the recipes were tested there.

The fact that honey consists principally of sugar and water and is slightly acid suggests that it is a suitable substitute for molasses in cookery. As a matter of fact, it can be used in the place of molasses in all forms or breads, muffins, and cakes, and makes a more delicately flavored product. It contains less acid than molasses, however, and so requires less soda when it is substituted for molasses in recipes which do not include sour milk or other acid, and the cook must be careful about the amount of soda used. Many trials, made with different kinds of honey in this laboratory, showed that the allowance of soda in a cupful of honey very generally ranges between  $\frac{1}{4}$  and  $\frac{1}{2}$  of a level teaspoonful. Unless the cook is thoroughly familiar with her honey, she would do well to mix and bake a small sample of dough before she decides on the amount of soda to be put into the main portion.

When honey is to be substituted for common sugar it is desirable to know not only how it compares in sweetness, but also how much allowance must be made for the water which it contains. Assuming a cupful of good honey to measure  $\frac{1}{2}$  pint, it should weigh about 12 ounces. Of this, 9 to 10 ounces, roughly speaking, is sugar. A cupful of honey, therefore, corresponds to a little more than a cupful of cane sugar. Hence it is safe to estimate that a cupful of honey will sweeten a dish just about as much as a cupful of sugar. Besides the sugars, there is about  $\frac{1}{5}$  of a cupful of water in a

cupful of honey. Theoretically, therefore, in making cake one should substitute honey for sugar, cupful for cupful, and for each cupful of honey use  $\frac{1}{5}$  cupful less of the milk or other liquid which the recipe calls for. For practical purposes, however, it is accurate enough to consider that the water in a cupful of honey is  $\frac{1}{4}$  of a cupful. This rule was found to hold good with a large number of ordinary cake recipes which were tested in this laboratory. These facts, if kept in mind, make special honey recipes unnecessary, and enable the cook with very slight calculation to modify ordinary ones so that honey can be used in place of sugar. Besides slightly changing the flavor of the cake, honey used in the place of sugar makes it keep moist longer. A honey cake made with butter will keep its quality until the butter grows rancid, and one made without butter will keep fresh for months and even improve in flavor. What is true of the cakes is also true of the dough; it can be kept almost indefinitely. Evidently, then, honey is especially useful in recipes without butter. For this reason, most of the honey cakes experimentally studied in this laboratory were made according to the following formula, which is typical of Honigkuchen, or German Christmas cake: Three-fourths cup honey,  $\frac{1}{2}$  cup sugar, 2 cups or more flour,  $\frac{1}{4}$  teaspoon powdered ginger,  $\frac{1}{2}$  teaspoon powdered cardamom seed, 1 teaspoon cinnamon,  $\frac{1}{8}$  teaspoon cloves, a speck white pepper, a pinch salt,  $\frac{1}{4}$  to  $\frac{1}{2}$  teaspoon soda, 1 tablespoon water, and 2 ounces blanched almonds cut in small pieces or chopped.

The directions for making the honey cakes, not only in the older cook books, but also in many modern bakers' manuals, are extremely elaborate; one of the purposes of the experiments made in this laboratory

was to determine how many of the suggested precautions are necessary.

Recipes usually direct that the honey be brought to the boiling point and then skimmed and cooled. This must be done with great care, for the honey is very likely to boil over. Experiments with a large variety of honeys such as are ordinarily purchased in the United States for household use, showed that nothing rises to the top during the boiling which can not be easily stirred back into the liquid. It seems likely therefore that the custom of boiling had its origin at the time when honey, or at least the grades bakers use, was much less carefully prepared than at present and contained impurities of many kinds. A cake made by stirring flour directly into cold honey was found to be in no way inferior to those made with honey which had been heated.

Some recipes found in the older cook books, particularly those of foreign origin, direct that the spices be boiled with the honey, and give as a reason for this that the heating brings out their flavor and makes them "go further." The weight of this argument is obviously difficult to determine, but the work carried out in the Nutrition Laboratory gave no evidence that the short heating at the beginning is of special importance in comparison with the long heating which the materials must receive while the cake is being baked.

The older recipes almost invariably direct that the dough be kept for a certain length of time, sometimes one day, sometimes more, before the soda is added. So reliable an authority as König says that this is because, owing to the presence of bacteria, the acidity of the mixture increases with time, and that therefore more soda can be used after the dough has stood. To



test this point, dough was mixed in this laboratory and analyzed by the Bureau of Chemistry; it was found to have 0.0775 per cent of acidity immediately after being mixed, and 0.1 per cent after 4 days' time. Another sample increased in 6 days from 0.108 per cent to 0.117 per cent, and during the following 6 days to 0.125 per cent. It seems probable, therefore, that the acid does usually increase; but even so, the question arises whether there is not in the beginning enough acid, to act on soda, sufficient to raise the cake. In order to determine this, two samples of dough were mixed. To No. 1 the soda was added at once and baking followed immediately. No. 2 was kept for a week, when the soda was added and the cake was baked. The second was neither lighter nor in any way superior to the first.

It is frequently stated that the dough can be more easily kneaded if it is allowed to stand several days. In order to test this point, a dough was mixed which was stiff enough to hold its shape, but which stuck to the hands and the molding board. After a week's time it could be molded freely on an unfloured board without sticking to it. This argument for keeping the dough seems therefore to be sound.

It is sometimes said that the reason why cakes made with honey keep soft for a long time is that they absorb moisture from the air. To test this point a cake made according to the recipe already given was weighed at different intervals during 7½ months. The weight of the dough was 526 grams, the weight of the cake on the day of baking, April 17, 1913, was 499 grams after it had been removed from the pan, and at the final weighing on December 2 of the same year, it weighed 469.7 grams. The loss of weight was continuous

during all this time, with the exception that in the late summer there was a slight increase in the weight, probably due to unusual dampness of the air; this was followed by a relatively great loss. On December 2, when the cake was cut, it was in good condition, and had a fine flavor and the consistency of a soft cooky. The experiment was repeated with small honey cakes, and these also showed no increase in weight before softening. While these experiments are not sufficient for definite conclusions, they indicate that the increased softness of the honey cake is not due to the absorption of water.

Icing made with honey, or with part honey and part sugar according to the recipe given later, has the same advantage that honey cakes have. Such icing made in this laboratory was found at the end of 10 months to be soft and in as good condition as when originally made. It would, therefore, seem to be suitable for cakes that are to be kept for a long time.

In most of the recipes in foreign cook books "potash" (potassium bicarbonate) is recommended for use with honey to raise the dough. This is very similar in its properties to ordinary baking soda (sodium bicarbonate) and seems to have no advantage over it for this purpose. Whatever may have been the conditions in earlier times in Europe, baking soda is a common kitchen commodity in most American homes, and the potassium bicarbonate is almost unknown for household purposes. Both the potassium bicarbonate and baking soda gave much better results in the honey recipes tested than did the baking powder, and this is natural, since the acid honey calls for an alkali like soda rather than a mixture of acid and alkali such as baking powder. If baking powder were used, it should be in

addition to soda enough to neutralize the acid of the honey, not merely as a substitute for soda, just as housekeepers sometimes neutralize sour milk or molasses with soda and then add baking powder to raise the dough.

In the countries where honey cakes have come to perfection spices are used which are somewhat uncommon in this country, and it is reasonable to suppose that long experience has taught a good combination of flavors. Cardamom seed, a rather old-fashioned flavor which is still sometimes found in candies, seems to combine more satisfactorily with the flavor of honey than some of the spices which are better known in our kitchens. It is best, however, to use it in combination with other flavoring materials. The following has been found to be a good combination:

Salt, 1 part by measure.	Ginger, 4 parts.
White pepper, 1 part.	Cardamom, 8 parts.
Nutmeg, 2 parts.	Cinnamon, 16 parts.
Cloves, 2 parts.	

These should be thoroughly mixed and can be made up in quantity and kept ready for use.

Aniseed and coriander seed are also often used in honey cakes in combination with other spices. The following mixture is recommended in a baker's handbook,<sup>1</sup> the amounts given being suitable for 10 pounds of dough:

2 ounces ground cinnamon.	1 ounce finely ground cori-
$\frac{1}{2}$ ounce ground cloves.	ander seed.
2 ounces aniseed.	

In considering the uses of honey in cookery, it is well to remember that it owes its flavor to bodies which are

<sup>1</sup> The Twentieth Century Book for the Progressive Baker. By F. L. Gienandt. Boston, 1913, p. 129.



very volatile and that for this reason it should not be heated unnecessarily hot or unnecessarily long.

In order to learn how honey is used in cookery, standard cook-books from many countries were examined and many persons familiar with honey cookery were consulted. Innumerable as the recipes were, it was soon found that they belonged mainly to only a few different types, such as breads made with honey, honey cakes made with or without butter, fruits preserved in honey, and sauces and candies made with honey. Many recipes were tested in this laboratory, and some of the more desirable ones were adapted for use in the United States and are published here.

#### Bread and Muffins

Honey is not often used in bread making, but there is no reason why it may not be used in yeast bread as food for the yeast plant, or be substituted for molasses or sugar in varieties of bread which call for such sweetening. A few recipes are here given.

#### BRAN BROWN BREAD

1 cup white or whole wheat flour.	$\frac{1}{2}$ cup honey.
1 teaspoon soda.	1 cup sour milk.
$\frac{1}{4}$ teaspoon salt.	$\frac{1}{2}$ cup raisins floured.
1 cup bran.	

Sift together the flour, soda, and salt, and add the other ingredients. Steam three hours or bake 40 minutes in a slow oven. If the amount of milk is increased by half, the bread is more delicate and has a somewhat higher food value.

#### STEAMED BROWN BREAD

1 cup yellow corn meal.	1 teaspoon salt.
2 cups graham flour.	$1\frac{1}{2}$ teaspoons soda.
$\frac{2}{3}$ cup honey.	1 tablespoon boiling water.
2 cups sour milk.	1 cup seeded raisins.

Mix together the meal, flour, and salt; add the sour milk and the honey and then the soda dissolved in the boiling water; and the raisins. Steam 3 hours in covered receptacles, which should be not more than two-thirds full at the beginning of the cooking.

### HONEY BREAD

2 cups honey.	4 teaspoons powdered carda-
4 cups rye flour.	mom seed.
1 teaspoon soda.	2 egg yolks.
4 teaspoons aniseed.	$\frac{1}{4}$ cup brown sugar.
2 teaspoons ginger.	

Sift the flour with the spices and soda and add the other ingredients. Put the dough into shallow buttered pans to the depth of about an inch and bake in a hot oven.

### HONEY AND NUT BRAN MUFFINS

$\frac{1}{2}$ cup honey.	1 tablespoon melted butter.
1 cup flour.	$1\frac{1}{2}$ cups milk.
$\frac{1}{4}$ to $\frac{1}{2}$ teaspoon soda.	$\frac{3}{4}$ cup finely chopped English
$\frac{1}{4}$ teaspoon salt.	walnuts.
2 cups bran.	

Sift together the flour, and salt, and mix them with the bran. Add the other ingredients and bake for 25 or 30 minutes in a hot oven in gem tins. This will make about 16 large muffins, each of which may be considered roughly to be a 100-calory portion and to contain 2 grams of protein.

### HONEY AND NUT SANDWICHES

Mix the honey with pecan meats or almonds minced, and make into sandwiches with small baking-powder biscuits.

### HONEY AND CREAM CHEESE SANDWICHES

Mix honey with cream cheese and use as filling for bread or baking-powder biscuit sandwiches. Chopped nut may be added to the honey and cheese if desired.

## Cakes, Cookies, etc.

By far the most general use of honey in cookery is for cakes. Of these there is an almost endless variety, from rich fruit cake in loaves or elaborate pastries with honey filling, to simple cookies. As has been pointed out, the honey flavor combines especially well with spices. The presence of honey also makes the cakes keep fresh longer. These two facts probably explain why the honey cakes, which belong mainly to the general order of gingerbreads or spice cakes, are so largely produced by commercial bakers. Many of these are rather elaborate to make, and for that reason some of the simpler kinds of honey cakes may be preferred by the busy housekeeper.

## HARD HONEY CAKE

$\frac{3}{4}$ cup honey.	$\frac{1}{2}$ teaspoon cloves.
$\frac{1}{2}$ cup sugar.	Speck white pepper.
$2\frac{1}{2}$ cups flour.	Speck salt.
1 egg.	$\frac{1}{2}$ teaspoon soda.
$\frac{1}{4}$ teaspoon ginger.	1 tablespoon water.
1 teaspoon cinnamon.	2 ounces blanched almonds
$\frac{1}{2}$ teaspoon ground cardamom seed.	cut into small pieces or chopped.

Sift together the flour and spices, dissolve the soda in the water, beat the egg and combine all the ingredients. Beat or knead the mixture thoroughly. Cook a small sample. If it does not rise sufficiently, add a little more soda and honey; if it falls, add a little more flour. Roll out the dough to the thickness of about  $\frac{3}{4}$  inch and bake in a hot oven. When the cake is done glaze it with a thick sirup of sugar and water and allow it to dry in a slow oven or in some other warm place. While it is still warm, cut it into long strips. Or it may be left in one large cake, to be cut into very thin slices when served. This cake will become very hard on cooling and will not be soft enough to eat for several weeks, but will keep in good condition for an indefinite length of time.



## BUTTER HONEY CAKE

1½ cups honey.	1½ teaspoons soda.
½ cup butter.	2 tablespoons orange-flower
3 egg yolks.	water (water may be substi-
5 cups flour.	tuted).
2 teaspoons ground cinnamon.	Whites 3 eggs.
½ teaspoon salt.	

Rub together the honey and butter; add the unbeaten yolks and beat thoroughly. Add the flour sifted with the cinnamon and the salt; and the soda dissolved in the orange-flower water. Beat the mixture thoroughly and add the well-beaten whites of the eggs. Bake in shallow tins and cover with frosting made as follows:

## ORANGE FROSTING FOR BUTTER HONEY CAKE

Grated rind 1 orange.	1 tablespoon orange juice.
1 teaspoon lemon juice.	1 egg yolk.
Confectioners' sugar.	

Mix all the ingredients but the sugar and allow the mixture to stand for an hour. Strain, and add confectioners' sugar until the frosting is sufficiently thick to be spread on the cake.

For the cinnamon in the Butter Honey Cake the following mixture of spices may be substituted:

½ teaspoon ginger.	¼ teaspoon nutmeg.
2 teaspoons cinnamon.	¼ teaspoon white pepper.
1 teaspoon ground cardamom seed.	Chopped citron or nuts may also be added.
1 teaspoon cloves.	

This mixture may also be flavored with ginger, aniseed, or cardamom seed.

## BUTTER HONEY CAKE NO. 2

1 cup honey.	3 eggs.
½ cup butter.	3 cups flour.
½ teaspoon ginger.	½ to 1 teaspoon soda.
½ teaspoon cinnamon.	1 ounce candied orange peel.
1 teaspoon ground cardamom seed.	1 ounce candied lemon peel,
	or 1 cup seeded raisins.

Mix the honey and butter by warming slightly and stirring; add the spices and the yolks of the eggs unbeaten, and beat the mixture thoroughly. Add the flour and the soda dissolved in a little water, then the whites of the eggs beaten stiff, and finally the fruit. Bake in a moderate oven.

### NUT HONEY CAKE

2 cups brown sugar.	$\frac{1}{2}$ teaspoon allspice.
2 cups honey.	1 cup chopped raisins.
6 egg yolks.	$\frac{1}{2}$ ounce citron cut in small pieces.
3 cups flour.	$\frac{1}{2}$ ounce candied orange peel cut in small pieces.
Speck of salt.	$\frac{1}{2}$ pound almonds coarsely chopped.
$1\frac{1}{2}$ teaspoons soda.	Whites of 3 eggs.
3 teaspoons ground cinnamon.	
$\frac{1}{2}$ teaspoon ground cloves.	
$\frac{1}{2}$ teaspoon ground nutmeg.	

Mix the sugar, honey, and the yolks of the eggs, and beat thoroughly. Sift together the flour, salt, spices, and soda. Combine all ingredients but the whites of the eggs. Beat the whites of the eggs till they are stiff and add them last. Pour the dough to the depth of about  $\frac{1}{2}$  inch into well-buttered tins, and bake in a slow oven for  $\frac{1}{2}$  hour.

### FROSTING FOR NUT HONEY CAKE

$1\frac{1}{2}$ cups sugar.	$\frac{3}{4}$ cup water.
3 egg whites.	

Boil the sugar and water until the sirup forms a thread when dropped from the spoon. While still hot, pour the sirup over the well-beaten whites of the eggs, beating the mixture until it is of the right consistency to spread.

### CHOCOLATE NUT HONEY CAKE

To the above cake add 3 ounces of chocolate grated.

### SOFT HONEY CAKE

$\frac{1}{2}$ cup butter.	1 teaspoon soda.
1 cup honey.	$\frac{1}{2}$ teaspoon cinnamon.
1 egg.	$\frac{1}{2}$ teaspoon ginger.
$\frac{1}{2}$ cup sour milk.	4 cups flour.

Rub the butter and honey together; add the egg well beaten, then the sour milk, and the flour sifted with the soda and spices. Bake in a shallow pan.

### HONEY SPONGE CAKE

$\frac{1}{2}$  cup sugar.

4 eggs.

$\frac{1}{2}$  cup honey.

1 cup sifted flour.

Mix the sugar and honey, and boil until the sirup will spin a thread when dropped from the spoon. Pour the sirup over the yolks of the eggs, which have been beaten until light. Beat this mixture until cold; then add the flour, and cut and fold the beaten whites of the eggs into the mixture. Bake for 40 or 50 minutes in a pan lined with buttered paper, in a slow oven.

This cake can be made with a cupful of unheated honey in place of the honey and sugar sirup, but the quality is not quite so good.

### HONEY POUND CAKE

A good pound cake can be made by using equal weights of honey, sugar, eggs, flour, and butter. A little soda should be added because of the acidity of the honey, and a good flavoring is cardamom seed and orange-flower water. Or a cake similar to pound cake may be made as follows:

1 cup sugar.

$\frac{1}{2}$  teaspoon powdered cardamom seed.

$\frac{3}{4}$  cup honey.

$\frac{1}{2}$  teaspoon soda.

1 cup butter.

$\frac{1}{2}$  teaspoon orange-flower water.

4 eggs.

2 cups pastry flour.

Rub together the butter and sugar, and add the honey. Add the yolks of the eggs well beaten. Finally, add the whites of the eggs, beaten to a stiff froth, and the orange-flower water. Add gradually the flour sifted with the soda and cardamom seed. Beat the mixture for 10 minutes. Put the dough into a warm tin with high sides, and bake in a slow oven 1 hour.



## RIBBON CAKE

## UTILIZING CANDIED HONEY AS FILLING

$\frac{1}{2}$ cup butter.	$1\frac{1}{2}$ teaspoons ginger.
2 cups sugar.	$\frac{3}{4}$ teaspoon cinnamon.
4 eggs.	$\frac{1}{4}$ teaspoon cloves.
1 cup milk.	$\frac{1}{3}$ cup raisins, seeded and cut in pieces.
$3\frac{1}{2}$ cups flour.	$\frac{1}{3}$ cup figs, finely chopped.
5 teaspoons baking powder.	1 tablespoon honey.
$1\frac{1}{2}$ teaspoons ground cardamom seed.	

Rub the butter and sugar together and add the yolks of the eggs. Sift together the flour and baking powder and add them to the mixture, alternating them with the milk. Finally, add the whites of the eggs well beaten. Bake  $\frac{2}{3}$  of the mixture in two layer-cake pans. To the remainder add spices, fruit, and honey, and bake in a layer-cake pan. Put layers together with crystallized honey.

## HONEY FRUIT CAKE

3 cups flour.	$1\frac{1}{2}$ pounds currants.
2 teaspoons soda.	1 pound citron.
$3\frac{1}{2}$ cups honey.	1 pound candied cherries.
1 cup butter.	1 pound candied apricots.
6 eggs.	1 pound candied pineapple.
2 teaspoons cinnamon.	$\frac{1}{2}$ cup sour jelly, or
2 teaspoons ginger.	$\frac{1}{2}$ cup white grape juice.
3 teaspoons ground cardamom seed.	2 teaspoons vanilla.
$\frac{1}{2}$ teaspoon cloves.	2 ounces candied orange peel.
3 pounds raisins (seeded).	2 ounces candied lemon peel.

Cut the candied fruit into small pieces, with the exception of the cherries, which should be left whole. Place the fruit in a large dish and sift over it  $\frac{1}{2}$  of the flour, mixing thoroughly. Sift the soda with the remainder of the flour. Bring the honey and the butter to boiling point, and while still hot add the spices. When the mixture is cool, add the well-beaten yolks of the eggs, then the flour and grape juice or jelly and the well-beaten whites. Finally, add the fruit. The cake should be divided into 3 or 4

parts and put into buttered dishes covered with buttered paper tied closely over the tops. Steam for five hours, remove the paper, and bake in a very slow oven for an hour. This makes a very rich cake consisting chiefly of fruit. For the sake of economy, the flour can be increased to even twice the quantity without affecting the quality very much.

### HONEY FRUIT CAKE NO. 2

4 cups flour.	$\frac{1}{2}$ teaspoon cloves.
3 teaspoons soda.	3 pounds raisins (seeded).
2 cups honey.	4 ounces citron.
1 cup butter.	1 pound cranberries.
6 eggs.	1 pound canned pineapple.
2 teaspoons cinnamon.	1 pound dried apricots.
2 teaspoons ginger.	1 pound dried apples.
3 teaspoons ground cardamom seed.	

To prepare the cranberries, pineapple, apricots, and apples, cook each in honey till it is soft; remove from the honey and dry in a very slow oven. A little water should be added to the honey in which the cranberries are cooked, a good proportion of ingredients being equal weights of cranberries, water, and honey. To any honey left over from cooking the fruits, add enough honey to make up the total amount called for by the recipe. Mix and cook the cake in the same manner as honey fruit cake No. 1.

### HONEY DROP CAKES

$\frac{3}{4}$ cup honey.	$1\frac{1}{2}$ to 2 cups flour.
$\frac{1}{4}$ cup butter.	$\frac{1}{2}$ teaspoon soda.
$\frac{1}{2}$ teaspoon cinnamon.	2 tablespoons water.
$\frac{1}{8}$ teaspoon cloves.	1 cup raisins, cut into small pieces.
1 egg.	

Heat the honey and butter until the butter melts. While the mixture is warm add the spices. When it is cold add part of the flour, the egg well beaten, the soda dissolved in the water, and the raisins. Add enough more flour to make a dough that will hold its shape. Drop by spoonfuls on a buttered tin and bake in a moderate oven.

## YELLOW HONEY CAKE

$\frac{1}{2}$ cup sugar.	$\frac{1}{4}$ teaspoon cinnamon.
2 egg yolks.	$\frac{1}{8}$ teaspoon cloves.
$\frac{2}{3}$ cup honey.	$1\frac{1}{2}$ cups flour.

Sift together the flour and the spices. Mix the sugar and egg yolks, add the honey, and then the flour gradually. Roll out thin, moisten the surface with egg white, and mark into small squares. Bake in a moderate oven.

## HONEY COOKIES NO. 1

$\frac{2}{3}$ cup honey.	1 teaspoon allspice.
$\frac{2}{3}$ cup sugar.	2 ounces finely chopped candied orange peel.
$2\frac{1}{2}$ cups flour.	$\frac{1}{4}$ pound walnut meats finely chopped.
$\frac{1}{2}$ teaspoon soda.	
$1\frac{1}{2}$ teaspoons cinnamon.	
1 teaspoon cloves.	

Sift together the flour, spices, and soda, and add the other ingredients. Knead thoroughly, roll out thin, and cut with a biscuit cutter. These cookies are very hard.

## HONEY COOKIES NO. 2

$\frac{3}{4}$ cup honey	$\frac{1}{2}$ teaspoon salt.
$\frac{2}{3}$ cup sugar.	1 teaspoon ground cinnamon.
$\frac{1}{2}$ cup milk.	$\frac{1}{2}$ cup finely chopped almonds.
3 tablespoons lard.	$\frac{1}{2}$ teaspoon soda or 2 teaspoons baking powder.
2 egg yolks.	
4 cups flour.	

Bring the first four ingredients to the boiling point and allow the mixture to cool. Sift together the flour, cinnamon, and soda or baking powder. Combine all the ingredients. Roll the mixture out thin on a floured board. Cut out and bake in a moderate oven on tins which have been greased and floured. To prepare the tins properly, brush them over with melted butter and sifted flour, turn them over, and shake off as much as possible of the flour.



## HONEY COOKIES NO. 3

$\frac{1}{4}$ cup water.	1 teaspoon soda.
1 pound brown sugar or 2 cups packed solidly.	6 cups flour.
$\frac{1}{2}$ cup lard.	1 teaspoon powdered carda- mom seed.
1 cup honey.	1 teaspoon cinnamon.
$\frac{1}{3}$ cup egg yolks.	

Heat the water, sugar, lard, and honey until the lard is melted. When cool, add the yolks of the eggs and the flour, sifted with the soda, and spices. Roll out on a floured board and cut into any desired shape. Place a small piece of citron in the middle of each cooky.

## HONEY BRAN COOKIES NO. 1

2 tablespoons butter.	$\frac{1}{2}$ cup flour.
$\frac{1}{2}$ cup honey.	1 cup bran.
2 eggs.	$\frac{1}{3}$ teaspoon powdered aniseed.
$\frac{1}{4}$ to $\frac{1}{2}$ teaspoon soda.	

Rub together the butter and honey; add the eggs unbeaten and beat the mixture thoroughly. Sift together the flour, soda, and aniseed. Combine all the ingredients; drop from a teaspoon on to a buttered tin and bake in a moderate oven.

## HONEY BRAN COOKIES NO. 2

3 cups bran.	$\frac{1}{4}$ teaspoon ginger.
$\frac{1}{2}$ cup sugar.	$\frac{1}{2}$ cup honey.
$\frac{1}{4}$ to $\frac{1}{2}$ teaspoon soda.	$\frac{1}{2}$ cup milk.

Mix the sugar, cinnamon, ginger, and soda with the bran and add the other ingredients. Drop from a spoon upon a buttered pan and bake about 15 minutes.

## ROLLED HONEY WAFERS NO. 1

$\frac{1}{4}$ cup butter.	$\frac{1}{4}$ teaspoon powdered carda- mom or aniseed.
$\frac{3}{4}$ cup honey.	
$\frac{7}{8}$ cup flour.	

Mix together the butter and honey and add the flour, sifted with the spice. Spread out very thin with a broad long-bladed

knife or spatula on a buttered, inverted dripping pan, or on flat tins made for the purpose. Mark off in 3-inch squares and bake in a slow oven until delicately browned. While warm, roll into tubular shape and hold until they cool and, if necessary, until they harden into shape. Honey wafers are not quite so tender as those made with sugar.

### ROLLED HONEY WAFERS NO. 2

$\frac{1}{4}$ cup honey.	$\frac{1}{6}$ cup milk.
$\frac{1}{4}$ cup sugar.	$\frac{1}{4}$ teaspoon cardamom or
$\frac{1}{4}$ cup butter.	aniseed.
$\frac{7}{8}$ cup flour.	

Cream the butter; add the sugar, honey, and flour in the order named, and the milk very gradually. Cook as rolled honey wafers No. 1.

### NOUGAT WAFERS

$\frac{1}{2}$ cup butter.	4 teaspoons ginger, or
1 cup brown sugar.	2 teaspoons powdered carda-
$\frac{1}{2}$ cup milk.	mom or aniseed.
$\frac{7}{8}$ cup bread flour.	

Rub together the butter and the sugar, and add alternately the milk and the flour sifted with the spices. Spread in a very thin layer on the bottom of an inverted dripping pan or on flat tins made for the purpose. Mark off into pieces about an inch wide and 4 inches long and put together in pairs with honey nougat filling made as follows:

#### HONEY FILLING FOR NOUGAT WAFERS

1 cup sugar.	$\frac{1}{4}$ cup water.
$\frac{1}{2}$ cup honey.	2 egg whites.

Boil the sugar, water, and honey together until the sirup makes a thread when dropped from a spoon, or until drops of it hold their shape when poured into cold water. Beat the eggs to a stiff froth, pour the sirup over them, put the dish holding the mixture in a place where it will keep warm but not cook rapidly, and beat it until it will hold its shape.

## HONEY RISSOLES

## PASTRY COVERING FOR RISSOLES

$\frac{1}{3}$ cup lard.	$\frac{2}{3}$ cup water.
2 egg yolks.	$\frac{1}{4}$ cup brown sugar.
1 egg white.	Flour.

Mix together all the ingredients but the flour and add enough of that to make a stiff dough. Roll out as thin as a knife blade, cut into round or square pieces, taking care to avoid the necessity of rolling out the second time, as this is likely to make the dough very tough. A honey filling is used with this dough and is made as follows:

## HONEY FILLING FOR RISSOLES

1 cup honey.	Rye bread crumbs.
2 ounces candied orange peel.	Aniseed.

Bring the honey to the boiling point, remove from the stove, and add as much bread crumb as it will moisten while it is hot, Add the orange peel and enough powdered aniseed to give a decided flavor. Roll this filling into small balls and lay one in the center of each piece of pastry; fold the pastry over and press the edges together. Bake in a hot oven.

## Desserts

The following recipes suggest ways in which honey can be substituted for sugar or molasses in many common desserts. The ingenious cook with honey to spare can easily work out others if she remembers what has been said in this bulletin about the sweetening power, and water and acid content, of honey:

## BAKED HONEY CUSTARD

5 eggs.	$\frac{1}{8}$ teaspoon powdered cinnamon.
$\frac{1}{2}$ cup honey.	
4 cups scalded milk.	$\frac{1}{4}$ teaspoon salt.

Beat the eggs sufficiently to unite the yolks and whites, but not enough to make them foamy. Add the other ingredients



and bake in a moderate oven. The baking dishes should be set in water.

### BOILED HONEY CUSTARD

2 cups milk.	$\frac{1}{3}$ cup honey.
3 egg yolks.	$\frac{1}{8}$ teaspoon salt.

Mix the honey, eggs, and salt. Scald the milk and pour it over the eggs. Cook in a double boiler until the mixture thickens. This custard is suitable for use in place of cream on gelatin desserts, or to be poured over sliced oranges or stewed fruit.

### HONEY PUDDING

$\frac{1}{2}$ cup honey.	$\frac{1}{2}$ teaspoon ginger.
6 ounces bread crumbs.	2 egg yolks.
$\frac{1}{2}$ cup milk.	2 tablespoons butter.
Rind of half a lemon.	2 egg whites.

Mix the honey and the bread crumbs and add the milk, seasonings, and yolks of the eggs. Beat the mixture thoroughly and then add the butter and the whites of the eggs well beaten. Steam for about two hours in a pudding mold which is not more than three-quarters full.

### HONEY CHARLOTTE RUSSE

1 quart cream.	$\frac{1}{2}$ cup delicately flavored
Lady fingers.	honey.

Chill the honey by placing the dish containing it in a pan of ice water. Whip the cream and add it to the honey, mixing the two well. Line a dish with lady fingers and fill it with the honey and cream. Serve very cold.

### HONEY MOUSSE

4 eggs.	1 cup hot, delicately flavored
1 pint cream.	honey.

Beat the eggs slightly and slowly pour over them the hot honey. Cook until the mixture thickens. When it is cool, add the cream whipped. Put the mixture into a mold, pack in salt and ice, and let it stand 3 or 4 hours.

## HONEY ICE CREAM NO. 1

1 quart thin cream.  $\frac{3}{4}$  cup delicately flavored  
honey.

Mix ingredients and freeze.

## HONEY ICE CREAM NO. 2

1 pint milk. 1 cup honey.  
Yolks 6 eggs. 1 pint cream.

Heat the milk in a double boiler. Beat together the honey and eggs, add the hot milk, return the mixture to the double boiler, and cook until it thickens. Add the cream and when the mixture is cool, freeze it.

## Preserved Fruits

## CURRANTS

Bar-le-Duc currants, an article of commerce often made with honey, sell for a relatively high price, in part no doubt because of the large amount of labor involved in preparing them. The seeds are removed from the currants by a method which mutilates the fruit very slightly; the fruit is then preserved in honey or sugar sirup. Those who wish to take the time to preserve currants in this way will find that a convenient way to remove the seeds is to cut a small slit in the side of each currant and remove the seeds by means of a needle. After this is done, weigh the currants and take an equal weight of honey. Bring the honey to the boiling point, add the currants, and allow them to cook at the boiling point for 2 or 3 minutes, or until the skins are tender, being careful not to let the mixture boil violently because this is likely to destroy the shape of the fruit. If the currants are <sup>so</sup> juicy as to liquefy the honey too much, they may be removed and the sirup reduced to the desired consistency, after which the currants may be replaced.

It is possible, of course, to preserve currants in honey according to the same recipe without the removal of the seeds, but the preserve thus obtained is not nearly so delicate as when the seeds are removed.

## CRANBERRIES

A very good preserve may be made, from cranberries and honey, which will remain in good condition for a long time. Take equal weights of cranberries, honey, and water. Cook the berries in the honey and water until the skins are soft. Remove the berries and boil down the sirup until just enough remains to cover the berries. Pour into glasses and cover as you would jelly. The appearance of the cranberries is improved if each one is pricked several times before cooking, and if the cooking is slow at first. This gives the sirup an opportunity to penetrate the berries without destroying their form. A satisfactory method is to place all the ingredients in a double boiler and heat them very slowly. If this method is followed, the boiling down of the sirup is even more necessary than when the berries are cooked more rapidly.

## STRAWBERRIES

Take equal weights of strawberries and honey; mix the two and dry in the sun, or preferably in a warm oven; put into carefully sterilized glasses and cover with paraffin.

## APPLES

2 quarts apples cut into small	1 cup vinegar.
pieces.	1 teaspoon cinnamon.
2 cups honey.	

Heat the honey, vinegar, and cinnamon together and cook the apples, a few at a time, in the sirup until they become transparent. Pour the sirup, which remains after all the fruit is cooked, over the apples.

## FRUIT AND HONEY JELLY

A good jelly may be made from winter apples and honey, using a cupful of honey to each cupful of apple juice and proceeding as in ordinary jelly-making. Honey could probably be used with other fruits suitable for jelly, but no definite directions have been worked out in this laboratory. The more delicately flavored honeys are probably best for this purpose, alfalfa giving an especially spicy taste.



## Ices, Sauces, Candies, etc.

## HONEY ICING

1 cup granulated sugar.	$\frac{1}{4}$ cup honey.
$\frac{1}{4}$ cup water.	1 egg white.

Boil together the sugar and the water for a few moments and then add the honey, taking precautions to prevent the mixture from boiling over, as it is likely to do. Cook until drops of the sirup keep their form when poured into cold water, or to about 250° F. Beat the white of the egg until stiff, and when the sirup has cooled slightly pour over the egg, beating the mixture continuously until it will hold its shape. This frosting is suitable for use between layers of cake, but is rather too soft for the top. It remains in good condition and soft enough to be spread for many weeks and, therefore, can be made in large quantities for use as needed. After 8 months, such icing made in this laboratory was found to be in good condition and soft enough to cut.

## SAUCE FOR ICE CREAM

2 tablespoons butter.	$\frac{1}{2}$ cup honey.
2 teaspoons cornstarch.	

Cook together the cornstarch and butter thoroughly, being careful not to brown them. Add the honey and cook the mixture until it becomes hard when dropped into cold water and until all taste of raw cornstarch has been removed.

## PUDDING SAUCE

If a small quantity of water be added to the above sauce, its consistency is entirely changed; it becomes thinner and can not be made brittle even by dropping it into cold water. It is suitable for serving on various kinds of puddings.

## STRAWBERRY SAUCE

Strawberry sauce, for puddings or boiled rice, which is usually made by mixing butter, sugar, and mashed berries, is a good means of securing the strawberry flavor at times when berries are too high-priced to be used in large quantities. The substitution of honey for sugar has proved to be practicable. In fact,

it obviates one of the chief difficulties in making this sauce—the tendency to curdle.

2 tablespoons butter.  $\frac{1}{2}$  cup honey.  
 $\frac{2}{3}$  cup mashed strawberries.

Beat together the honey and butter. Add the strawberries slowly, keeping the mixture cool by setting the dish in water. Serve on boiled rice or cottage pudding.

### SALAD DRESSING

4 egg yolks. 1 teaspoon mustard.  
 2 tablespoons vinegar or 1 teaspoon salt.  
 lemon juice. Paprika to taste.  
 2 tablespoons butter. 1 cup cream.  
 2 tablespoons honey.

Heat the cream in a double boiler. Beat the eggs, and add to them all the other ingredients but the cream. Pour the cream slowly over the mixture, beating constantly. Pour into the double boiler and cook until it thickens, or mix all the ingredients but the cream and cook in a double boiler until the mixture thickens. As the dressing is needed, combine this mixture with whipped cream. This dressing is particularly suitable for fruit salads.

### NOUGAT

$\frac{3}{8}$  cup honey. 1 pound almonds.  
 $\frac{1}{2}$  cup brown sugar. 2 egg whites.

Boil the honey and sugar together until drops of the mixture hold their shape when poured into cold water. Add the whites of the eggs, well beaten, and cook very slowly, stirring constantly, until the mixture becomes brittle when dropped into water. Add the almonds and cool under a weight. The candy can be broken into pieces, or may be cut and wrapped in waxed paper.

### HONEY FUDGE

2 cups sugar.  $\frac{1}{3}$  cup water.  
 $\frac{1}{3}$  cup honey. 2 egg whites.  
 1 teaspoon of vanilla extract.

Boil together the sugar, honey, and water until the sirup spins a thread when dropped from a spoon (about 250° F.). Pour the sirup over the well-beaten whites of the eggs, beating continuously and until the mixture crystallizes, adding the flavoring after the mixture has cooled a little. Drop in small pieces on buttered or paraffin paper. The vanilla may be omitted.

### HONEY CARAMELS

2 cups granulated sugar.	$\frac{1}{4}$ cup honey.
$\frac{1}{2}$ cup cream or milk.	$\frac{1}{4}$ cup butter.

Mix the ingredients; heat and stir until the sugar is dissolved; then cook without stirring until a firm ball can be formed from a little of the mixture dropped into cold water. Beat the mixture until it crystallizes, pour into buttered pans, and cut into squares. The addition of pecan nuts improves these caramels.

### HONEY POPCORN BALLS

Honey can be heated up to about 245° F. without being greatly changed in color or flavor. If it is heated carefully most of the water is expelled. The honey then becomes hard on cooling and can be used for making popcorn balls. To make them, dip the popped corn into the hot honey, shape into balls and cool. Honey popcorn balls absorb moisture on standing in the air. They must therefore be either kept very closely covered or reheated and dried before being used.



# U. S. DEPARTMENT OF AGRICULTURE FARMERS' BULLETIN NO. 717

---

## FOOD FOR YOUNG CHILDREN

CAROLINE L. HUNT

Scientific Assistant, Office of Home Economics

---

*Contribution from States Relations Service*

A. C. TRUE, Director

---

## INTRODUCTION

A little child who is carefully fed in accordance with his bodily needs (as these are now understood) receives every day at least one food from each of the following groups:

1. Milk and dishes made chiefly of milk (most important of the group as regards children's diet); meat, fish, poultry, eggs, and meat substitutes.
2. Bread and other cereal foods.
3. Butter and other wholesome fats.
4. Vegetables and fruits.
5. Simple sweets.

Milk, if it can be procured, should form part of the

food of every child, except when for some special reason the doctor objects, and this he seldom does.

As to the amounts that should be served, a good rule is to provide three or four glasses ( $1\frac{1}{2}$  pints to 1 quart) of milk a day; an egg or its equivalent in moderately fat meat, fish, poultry, or meat substitute; fruit and vegetables each once a day; 1 to 2 ounces of butter or other wholesome fat; and all the bread or other cereal food the child will eat. One or two ounces of sugar, candy, or other sweet (including the sugar used in cooking) may also be allowed, if this does not prevent eating the other foods mentioned.

The following bills of fare are simple, easy to prepare, sufficiently varied, and, if well prepared, should taste good. They are so planned that milk and another food from group 1, and a food from each of the other groups, will be served at least once a day.

### Suggested Bills of Fare

#### Breakfast

Orange (juice only for the  
youngest children).  
Farina with milk.  
Bread and butter.

Stewed prunes (pulp and juice  
only for the youngest chil-  
dren).  
Corn-meal mush and milk.  
Toast and butter.

---

Apple sauce.  
Oatmeal with milk.  
Toast and butter.

---

Grape fruit (juice only for the  
youngest children).  
Milk toast with grated yolk  
of hard-boiled egg.

---

Baked pears (pulp and juice only  
for the youngest children).  
Milk toast.  
Cocoa.

---

Apple (scraped for very little  
children).  
Toast.  
Hot milk.

In each case enough milk should be given to make up the required daily amount, which is about a quart.

### Dinner

Meat soup.	Creamed potatoes.
Egg on toast.	Green peas.
String beans.	Stewed plums with thin cereal-
Rice pudding.	milk pudding.
-----	-----
Roast beef.	Baked halibut.
Baked potato.	Boiled potatoes.
Asparagus.	Stewed celery.
Bread and jelly.	Boiled rice with honey or
-----	sirup.
Lamb stew with carrots and	-----
potato.	Broiled meat cakes.
Twice-baked bread.	Grits.
Tapioca custard.	Creamed carrots.
	Bread, butter, and sugar
	sandwiches.

In each case enough milk should be given to make up the required daily amount, which is about a quart.

### Supper

Baked potatoes, served with cream	Graham crackers and milk.
and salt, or with milk gravy.	Baked custard.
Cookies.	-----
-----	-----
Bread and milk.	Milk toast.
Apple sauce.	Stewed peaches.
Sponge cake.	Cup cake.
-----	-----
Potato-milk soup.	Celery-milk soup.
Twice-baked bread.	Toast.
Marmalade sandwiches.	Floating island.

In each case enough milk should be given to make up the required daily amount, which is about a quart.



Though all the foods mentioned in the bills of fare may be included under five heads, the diet need not be monotonous, for many foods come under each class. The different groups are described in the pages that follow.

### **Food Group No. 1. Milk and Dishes Made Chiefly from It; Fish, Poultry, Eggs, and Meat Substitutes**

The different foods mentioned in the heading of this group have enough in common to warrant bringing them together. However, milk is such an important food for children that it is desirable to speak of it by itself.

#### **Milk Served in Various Ways**

Milk is the natural food of babies and the most important food for young children. A quart of milk a day is a good allowance for a child. The greater part of this is usually given as a drink or served on cereals or in the form of bread and milk. Milk may also be served on fruits that are not very acid (baked apples or pears, berries, and others), in soups, gravies, custard, junket, and other puddings, and may be used in place of water in cooking cereals.

#### **CEREALS AND MILK**

Thoroughly cooked cereals served once a day for the first course and once a day for dessert encourage the use of milk. Directions for preparing them will be found in this bulletin. Any cereal may be cooked in milk besides being served with it. Skim milk which might otherwise be thrown away may be used for the purpose. Rice, cooked in an uncovered double boiler, or in a pan in a very "slow" oven, can be made to

absorb about six times its volume of skim milk. To cook a cupful of rice in this way instead of in water may be considered equivalent, so far as tissue-forming materials are concerned, to serving it with half a pound of lean beef.

### MILK TOAST

The following is a good method for making milk toast. Put on the table hot crisp toast or twice baked bread and a pitcher of hot milk, slightly salted. One-fourth teaspoonful of salt to a cupful of milk is sufficient. Pour the milk over the toast as needed, using hot bowls or deep saucers for serving. This is the easiest way of serving milk toast, and, if care is taken to have all the dishes hot and to salt the milk, it is usually acceptable. A supply of twice-baked bread can be kept on hand and heated, as needed, to crisp it.

Another way to make milk toast is to thicken milk and pour it over toast. For 1 cup of milk allow  $1\frac{1}{2}$  level teaspoons of flour and  $\frac{1}{4}$  teaspoon of salt. Make a smooth paste out of the flour, salt, and a little of the milk. Heat the rest of the milk; add the flour and milk mixture and boil for about 5 minutes, stirring constantly, or cook 20 minutes in a double boiler, stirring constantly at first and frequently later on. If skim milk is used, a level teaspoonful of butter or bacon fat should be added after the gravy is prepared.

An easier and quicker method of making the sauce or "milk gravy" is to cook the flour thoroughly in a tablespoonful of fat before adding the milk. This, however, is not thought to be so wholesome as the kind of gravy in which the flour is cooked in the milk.

Milk gravy may be combined with dried beef or

salt codfish which has been cut into small pieces and soaked in warm water, or with small pieces of tender meat, chicken, fish, or vegetables. Such gravy may be served with toast, with baked or boiled potatoes, or with boiled rice or other cereals. Dishes of this kind are more suitable for dinner than for supper.

Milk toast with the yolk of a hard-boiled egg grated over it makes an attractive dish. The whites of the hard-cooked eggs are not suitable for a young child, nor for any child unless they are finely chopped or unless the child can be made to chew them well.

Milk, being a liquid, is sometimes classed with water, tea, and coffee, simply as a beverage, by those who do not understand its value as food. This is a great mistake. If all the water were to be driven off from a quart of tea or coffee, almost nothing would be left, and the little that remained would have little or no value as food. If, on the other hand, the water were driven off from a quart of whole milk, there would be left about half a cupful of the very best food substances, including butter fat, a kind of sugar not so sweet as granulated sugar and known as "milk sugar," and also materials which are needed to make muscles, bones, teeth, and other parts of the body. All these valuable food substances are ordinarily either dissolved or floating in the water of milk.

Besides all this nourishment, milk contains a very small amount of a substance or substances now thought to help the body of the child to make good use of other foods. For this reason milk is often called "growth promoting." Apparently nothing can serve so well as the basis for the diet of the healthy child.

Good whole milk is desirable, but if a mother is obliged to choose between clean milk and rich milk,



she had better take the clean milk. Best of all, of course, is clean whole milk, but if that can not be obtained it is better to use clean fresh skim milk than dirty or questionable whole milk. A quart of skim milk, even separator skim milk, contains about a third of a cupful of solid food, which is nearly all there was in the whole milk, except the butter fat.

When it is absolutely impossible to get fresh milk, condensed, powdered, or evaporated milk may be used, but before doing this parents should try in every way to get fresh milk for their children.

Compared with most other foods, milk contains much lime but very little iron. Spinach and other green vegetables and egg yolks are, on the other hand, very rich in iron. This is one reason why combinations of egg yolks and milk and of vegetables and milk are mentioned so often in this bulletin.

When milk is given to babies, the chill is usually taken from it. It is safe to do this for all young children. When milk is used as a drink it should be sipped, not gulped down.

Besides being served as a beverage, milk is often combined with many other foods, as follows:

#### BREAD AND MILK

This may well be the chief, if not the only, dish in the supper of little children. If the milk is not very rich, the bread should be spread with butter. Use well-baked bread, at least a day old, or toast, or occasionally crackers.

#### COCOA

For variety, milk flavored with cocoa may be served. Prepared cocoa is the most convenient, but cracked cocoa shells or nibs, which require long boiling, may be

used. A warm drink, made chiefly out of cocoa and water, is not to be confused with the more nourishing drink made by flavoring milk with cocoa, but it has its uses. Like clear soups, which contain little food in themselves, it may lead the child to eat freely of bread and other needed foods.

### MILK SOUPS

Another good way to serve milk to children is in soups. Milk-vegetable soups are made from cooked vegetables, chopped or strained, which in this form may be given to even the youngest children, and milk (whole or skim) slightly thickened. The vegetable may be asparagus, peas, beans of various kinds, celery, potatoes, turnips, carrots, spinach, kale, chard, beet roots or greens, parsnips, lettuce, cress, cauliflower, or almost any other.

#### GENERAL RECIPE FOR MILK-VEGETABLE SOUPS

2 cupfuls of milk.	$\frac{2}{3}$ of a cupful of a thoroughly
1 tablespoonful of flour.	cooked vegetable, finely
1 tablespoonful of butter.	chopped, mashed, or put
Salt.	through a sieve.

Thicken the milk with the flour as for milk gravy; add the other ingredients. If the soup is too thick, as it may be if the vegetable is starchy, thin it with milk or water. Milk tomato soup is not recommended for the youngest children. When it is served a little soda should be added to prevent the milk from curdling.

#### MILK STEW

1 quart of milk.	1 cupful of codfish cut into
1 cupful raw potatoes cut into	small pieces or just enough
small pieces.	to flavor the stew.
2 tablespoonfuls of butter or	
bacon fat.	

Soak the fish in lukewarm water until it is soft and the salt removed. Cook the potatoes in water until tender, drain them, add the milk and codfish, and bring to the boiling point; add the butter, and salt to taste.

In place of the codfish any other salt or fresh fish, oysters, or a little chipped beef may be used. Or the fish may be omitted and the soup made savory and palatable by adding a few drops of onion juice, or a vegetable cut into small pieces and cooked thoroughly.

### CEREAL-MILK PUDDINGS

Puddings made with milk and bread, rice, or some other cereal food, have long been recognized as desirable in the child's diet.

Such milk puddings as old-fashioned rice or Indian pudding may be the means of serving much milk in a wholesome way. From the following recipe for rice pudding other recipes can be easily made, the proportions in all cases being about the same:

#### RICE PUDDING

1 quart of milk.	$\frac{1}{8}$ teaspoonful of ground nutmeg, or cinnamon, or the grated rind of $\frac{1}{4}$ of a lemon.
$\frac{1}{3}$ cupful of rice.	
$\frac{1}{3}$ cupful of sugar.	
$\frac{1}{2}$ teaspoonful of salt.	

Wash the rice thoroughly, mix the ingredients, and bake 3 hours or more in a very slow oven, stirring occasionally at first.

#### GENERAL RECIPE FOR CEREAL-MILK PUDDINGS

For a quart of milk allow  $\frac{1}{3}$  cupful of any coarse cereal (rice, corn meal, cracked wheat, oatmeal, or barley) and  $\frac{1}{3}$  cupful of brown, white, or maple sugar,



sirup, honey, or molasses;  $\frac{1}{2}$  teaspoonful of salt;  $\frac{1}{8}$  teaspoonful of spice. The flavoring may be omitted when honey or molasses is used.

The above recipe makes quite a large pudding. It is often convenient to make a smaller one, and enough for a child's dinner can be made in the double boiler, allowing 2 level or 1 rounding tablespoonful each of cereal and of sugar (or other sweet) to a cupful of salted and flavored milk. Cook an hour or more without covering.

These puddings, if made thin, may be poured over stewed prunes or other cooked fruits, and are a good and economical substitute for the cream or soft custard usually used for that purpose.

#### CUSTARD AND OTHER MILK PUDDINGS

There are many other milk dishes which are used in the same way as this milk and cereal pudding. Recipes for some of them follow:

Junket, or "rennet custard," is milk that has been coagulated or curdled, a process not unlike one of the first steps in digestion. The curdling is brought about by the addition of "junket tablets" to the milk. Milk containing rennet will, if not disturbed, "set" in one piece resembling a custard. Junket differs little from milk in food value except for the presence of the sugar used for flavoring, but it gives variety to the diet. If served very cold it is refreshing in warm weather.

#### JUNKET

2 cupfuls of milk.	$\frac{1}{8}$ teaspoonful of salt.
$\frac{1}{4}$ cupful of sugar, honey, or sirup.	A few grains of nutmeg or
1 junket tablet.	cinnamon.

Warm the milk to about the temperature of the body,

crush the tablet, and add it with the other ingredients to the milk. Pour into one large or several small dishes and place in a warm (not hot) place to harden. Cool before serving.

#### BOILED CUSTARD

3 egg yolks.	$\frac{1}{8}$ teaspoonful of salt.
2 cupfuls of milk.	Flavoring.
$\frac{1}{4}$ cupful of sugar, honey, or sirup.	

Heat the milk in a double boiler. Thoroughly mix the eggs and sugar and pour the milk over them. Return the mixture to the double boiler and heat it until it thickens, stirring constantly. Cool and flavor. If the custard curdles, remove it from the fire and beat with a Dover egg beater. This custard may be served in place of cream on many kinds of dessert.

#### FLOATING ISLAND

In this dish the whites of eggs left over from boiled custard can be used to serve with it. Beat the whites until stiff, sweeten them a little, and cook them in a covered dish over water which is hot but not boiling, or cook them on top of the hot milk which is to be used in making custard. Lift them out with a wire egg beater or split spoon, and place on top of the custard. Decorate with small bits of jelly.

#### TAPIOCA CUSTARD

Tapioca custards may be made as follows: Add to the list of ingredients for boiled custard  $\frac{1}{4}$  cupful of pearl tapioca. Soak the tapioca in water for an hour or two, drain it, and cook in the milk until it is transparent. Proceed as for boiled custard.

## BAKED CUSTARD

In making allow 1 egg and 2 level teaspoonfuls of sugar and a few grains of salt and of nutmeg for each cupful of milk. Beat the eggs slightly and add the other ingredients. Bake in cups set in a pan of water in a moderate oven.

## SIMPLE ICE CREAMS

In the way they are used, ice creams and frozen custard may be grouped with the puddings. Plain ice cream made out of thin cream, sweetened and flavored, or out of cream and custard mixed, may be given to children occasionally.

A good ice cream may be made as follows: Allow  $\frac{1}{4}$  cupful of sugar to each cupful of thin cream (half milk and half cream); flavor and freeze.

A frozen custard, commonly called by housekeepers "ice cream" or "French ice cream," which contains eggs as well as milk and cream, may be made as follows: For each half cupful of milk allow  $\frac{1}{4}$  cupful of sugar, 1 or 2 egg yolks or 1 whole egg, and  $\frac{1}{2}$  cupful of cream. Make a custard out of all the ingredients but the cream. When it is cool, flavor it, add the cream and freeze.

## CARAMEL FLAVORING FOR USE IN CUSTARDS, ICE CREAMS, AND OTHER DESSERTS

An economical flavoring for any of the above desserts may be made by browning or caramelizing ordinary sugar. To each cupful of sugar add  $\frac{1}{4}$  cupful of water. Heat until well browned, stirring constantly, even after the dish has been taken from the fire, and until the danger of burning in the hot dish is passed. Before the mixture hardens, add hot water and cook until it



is about the consistency of thick sirup. Bottle and save for use as needed.

### **Meat, Fish, Poultry, Eggs, and Meat Substitutes**

The other foods included in group 1 with milk (considered by far the most important of them all for children) are meat, fish, poultry, eggs, and meat substitutes.

In some families children do not get enough meat and eggs; in others they get too much. A good general rule commonly followed is to give a child 2 years old or over, an egg every other day and about the same amount (2 ounces) of meat, fish, or poultry on the days that come between. If for any reason meat is omitted from the child's diet, special care must be taken to see that other suitable foods take its place—preferably an extra amount of milk or eggs.

Broiling and roasting are the best methods of preparing tender meat. Tough meat should be stewed or prepared in a fireless cooker, or first chopped and then broiled.

It is important to teach children to chew meat and other foods properly.

Fried meats, particularly those which are pan fried or cooked in a small amount of fat, should not be given to young children. One reason for this is that they are likely to be overcooked and tough, at least on the outside, and so are likely not to be properly chewed and to be swallowed in large pieces. Another reason is that the fat used in frying and also that which tries out of the meat is likely to be scorched and changed in composition. When this is the case, it is almost certain to be harmful.

Some recipes for cooking meat for children follow:

## BROILED CHOPPED MEAT }

Many cuts of meat too tough to be broiled whole may be prepared very satisfactorily by being chopped, salted, and broiled. Allow about  $\frac{1}{2}$  teaspoonful of salt to a pound of meat. For very little children the meat should be scraped instead of being chopped, for in this way the connective tissue is taken out. An egg or a little milk may also be added. The most important point is careful handling, for if the meat is pressed together it becomes tough and hard. If a wire broiler is used, the cakes should not be squeezed between the two sides. To avoid this, lay them on top of the broiler and turn them with a knife and fork.

## MEAT STEWS

Stews made out of meat and vegetables offer a very great variety of dishes, good in themselves and good also because they encourage the eating of bread. The meat used should, of course, be in good condition but need not be from a tender cut. The lower-priced cuts may be used with good results, provided they are made tender by long, slow cooking. Any vegetable may be added, including the tougher parts of lettuce and the leaves of celery. Rice, barley, macaroni, or even crusts of stale bread may be used in the stew to give variety. A stew containing a little meat, with one or more vegetables and a cereal, comes near to supplying all the needed foods, other than milk.

## MEAT STEW

2 pounds of one of the cheaper cuts	$\frac{1}{2}$ onion, chopped.
of beef.	$\frac{1}{4}$ cup of flour.
4 cups of potatoes cut into small	Salt.
pieces.	
$\frac{2}{3}$ cup each of turnips and carrots	
cut into $\frac{1}{2}$ -inch cubes.	

Cut the meat into small pieces, cover with boiling water, boil for 5 minutes, and then cook at a lower temperature until the meat is tender. This will require about 3 hours on the stove or five hours in the fireless cooker. Add the carrots, turnips, onions and salt during the last hour of cooking, and the potatoes 20 minutes before serving. Thicken with the flour diluted with cold water. If the dish is made in the fireless cooker, the mixture must be reheated when the vegetables are put in.

There is much to be said in favor of keeping a soup pot on the stove all the time, provided great care is taken not to allow the contents to grow stale. Into this pot can go clean portions of uncooked food and also clean foods left from the table, such as meat, milk, mashed potatoes, or other vegetables, crusts, cold cereal mushes, and even fruits. Soups made from such materials may not have great nutritive value, but, like those made out of materials bought for the purpose, they encourage the use of a large amount of bread, particularly if carefully seasoned.

### POULTRY

Chicken or turkey can be used for variety in a child's diet and are palatable stewed and served with rice. If roast chicken is used, select portions which are tender. It is well not to give a young child either highly seasoned stuffing (dressing) or rich gravy.

### FISH

The use of cured fish, fresh fish, and oysters in stews has been spoken of above. Boiled or stewed fish is also good for variety.



## EGGS

Eggs are especially useful food for young children. The chief point to remember in preparing them for children is that they must not be overcooked or they are likely to cause indigestion, as experience has shown. Everyone knows how the heat of cooking hardens the egg, and it is easy to understand why the digestive juices might have difficulty in penetrating such hard substance as the white of a hard-boiled egg. Overcooked yolks are also thought to be hard to digest. However, when eggs are cooked in the shell, the heat reaches the white before it does the yolk, and so there is more danger of the white being overcooked than of the yolk. The best ways of serving eggs for children are poached, soft-boiled, or coddled, though they may be scrambled for a change if one is careful not to scorch the fat used or to overcook the egg.

## CODDLED EGGS

Many means have been suggested for cooking eggs in such a way that the yolks will be cooked and the whites will not be overcooked. One of the most satisfactory is by coddling and is done as follows: Allow a cupful of water to each egg, bring the water to the boiling point, remove it from the fire, put in the eggs, cover the dish closely, and leave the eggs in the water for about 7 minutes. There is some uncertainty about this method, for eggs differ in weight and also in temperature at the time the cooking begins. On the whole, however, this method can be more depended on than others. Good results can be obtained by pouring hot water over eggs, if the same dish with the same amount of water is always used, but each cook must make her own rules.

## MEAT SUBSTITUTES

Milk and eggs, as stated above, are common meat substitutes. Among vegetable foods, dried beans, peas, lentils, and cowpeas, which are often classed together and called legumes, are the best substitutes for meat in the diet of older people, chiefly because they have large amounts of nitrogen needed for muscle building.

In this respect they have some advantage, though not a great one, over cereals. Beans and the other legumes are not to be recommended for young children except when milk, meat, eggs, fish, and poultry are not to be obtained. When used they should be cooked until they are reduced to a mush. Since the skins are likely to be tough, it is well to put the cooked legumes through a sieve.

A general recipe for soups made from beans, peas, lentils, cowpeas, and other legumes follows:

## SOUP FROM DRIED BEANS OR OTHER LEGUMES

1 cup dried legumes.	2 tablespoonfuls of flour.
1 quart of water or soup stock.	Salt and other flavoring.
2 tablespoonfuls of butter or savory fat.	

Soak the dried legumes in water overnight. Drain, add the water or stock, cook slowly on top of the stove for 3 hours or in a fireless cooker for 4 or 5 hours, or until tender. Renew the water as it boils away. Strain and thicken with the fat and flour rubbed together. These soups may be flavored in many ways. Sometimes a tomato, onion, a few celery tops, a sprig of parsley, or a mixture of vegetables is boiled with the beans or peas, or just before serving a few drops of onion juice, a little celery salt, or  $\frac{1}{4}$  level teaspoonful of curry powder is added. Sometimes the water used

is that in which ham or other meat has been boiled, but in such cases care must be taken not to have the liquid too fatty.

## **Food Group No. 2. Bread and Other Cereal Foods**

Cereal foods of some sort are used by children practically all over the world. Bread is the commonest cereal food in this country, though cereal mushes are also very generally used. Well-baked bread and thoroughly cooked breakfast cereals are both good for children and with milk should make up a large part of the diet. These two foods, bread and breakfast cereals, provide almost the same kinds of nourishment. Bread may therefore take the place, to a certain extent, of cereal mushes, and cereal mushes may take the place of bread, but neither can take the place of milk, meat, eggs, fruits, and vegetables.

An ordinary slice of bread (a  $\frac{3}{4}$ -inch slice cut from an ordinary loaf) is equal in food value to about half a cupful of boiled or steamed cereal and to about a cupful of puffed or flaked cereal. The mother who must feed her child very economically should calculate the cost of each and decide which is cheapest.

The relation of food to the condition of the bowels is an important matter. Grains, particularly those containing the outer or branny layers or coats, are laxative; so, too, are such mildly acid fruits as apples, oranges, and grape fruit. So far, therefore, as the important matter of preventing constipation is concerned, coarse grains and mildly acid fruits serve the same purpose. When fruits are to be obtained in abundance, the kind of cereal served is not of great importance. When they are not, the coarser cereals should be used. In the case of both cereals and fruits,



it is possible to overdo. Sometimes the coarser parts, such as bran and skin, do not agree with the child and, under these circumstances, they should be removed from the food before it is served. Some mothers find it necessary to strain oatmeal porridge, for example, and to remove the skins of apples.

### **Bread**

The yeast-raised bread given to young children should be at least a day old or should be toasted or twice baked. Most hot breads are likely to be swallowed in large pieces and are therefore not desirable. Hot breads which are almost all crust, like thin tea biscuits or crisp rolls, are least likely to cause trouble.

### **Milk Toast**

This very common bread dish has been discussed under milk.

### **Twice-baked Bread**

Bread cut or torn into small pieces and heated in a very slow oven until thoroughly dried and very delicately browned is good food for children. The warming oven of a coal stove is about hot enough for this purpose. In the case of gas ovens it is often difficult to get the gas low enough without having the door open a little way. The advantage of tearing instead of cutting the bread is that it makes it lighter in texture and easier to eat. The crust can be torn off from all but the ends of a loaf of bread in one piece. This crust should be torn into pieces about 2 inches wide. The inside of an ordinary loaf of bread will make 16 pieces of convenient size. Tear first across the loaf and then tear each half into eight pieces. It is usually necessary

to make a small cut first in order to start the tearing. It is well to keep the crusts separate, as otherwise they are likely to get too brown. Such bread will need to be reheated before being served unless it is kept in a warm place, like a warming oven.

The above is also a good way to use stale bread. Some people crush it and use it with milk as a breakfast food.

### Breakfast Cereals

Cereal mushes and other breakfast cereals are very common foods. Almost all of the well-known grains are used for this purpose, and there are many such products, owing to differences in manufacture.

Except when used for dessert, cereal mushes and ready-to-eat cereals should be served with milk and with very little, if any, sugar. If the cereals are heavily sweetened, children are likely to eat so much that they neglect other and much-needed foods. If carefully salted, mushes are more likely to satisfy the taste without sugar than otherwise. Well-cooked cereals with milk or stewed fruit or a little molasses, sirup, honey, or sugar make good desserts for dinner, lunch, or supper. If preferred, dried fruits, like dates and raisins, may be cooked with the cereal to sweeten it and to give flavor.

### Cooking Cereal Breakfast Foods

It is hard to give general rules for cooking cereals, for there are so many kinds, but it is safe to say that there is no danger of overcooking and much danger of undercooking them. Some grains need longer cooking than others—corn meal, for example, needs at least 3 hours and rice hardly more than half an hour. In general, whole grains, like whole wheat, or grains more

or less finely broken, like cracked wheat, require longer cooking (3 hours at least) than more finely-ground grains, such as farina (which should be cooked 1 hour at least). Breakfast foods made from grains with the outer coverings left on require more cooking than those with the outer covering removed—whole barley, for example, more than pearl barley. Many cereal foods, particularly the rolled and flaked types, have been partially cooked at the factory. These require less cooking in the home than those which have had no such treatment; but if they are to be served to children such cereals should be cooked at home for at least an hour. There are also cereal breakfast foods, which have been still more thoroughly cooked at the factory, either by parching in addition to flaking or by some other special method. These are improved by putting them into the oven long enough at least to crisp them.

Oatmeal, corn meal, and many other granular cereals can be put directly into cold water and cooked satisfactorily in a double boiler without stirring, the method being particularly good in the case of corn meal, which is likely to be lumpy if stirred into hot water. A convenient method for cooking cereals is to mix with the usual quantity of water, bring to the boiling point, boil for 3 or 4 minutes, and then put into a fireless cooker and leave 10 or 12 hours. Porridge or mush made in this way must be reheated before serving.

The quantity of water required differs with the cereal. A cupful of rolled oats requires at least 2 cupfuls of water; oatmeal or corn meal, 4 cupfuls; and rice, 3 cupfuls.

A level teaspoonful of salt to a cupful of cereal will usually be right, but it is well to experiment a little



with an unfamiliar cereal, since failure to salt mushes properly very often leads children to dislike them.

### **Food Group No. 3. Butter, Cream, Table Oil, and Other Fatty Foods**

Fat is an important part of the food of children. <sup>9</sup> This is not surprising, for it is found in considerable amounts in human milk, the natural food for babies. Butter, which consists chiefly of separated milk fat, and cream, which is rich in milk fat and also in the other nourishing substances of milk, are both wholesome. Salad oils of various kinds (olive, cottonseed, peanut, and others) may be given to children in small amounts. Those who are not used to table oil must often be trained to like it. This can usually be done by introducing it very gradually into the diet. A good way to serve it is on spinach and other greens or on tender salad vegetables.

There is more than an ounce of fat (at least  $2\frac{1}{2}$  level tablespoonfuls) in a quart of whole milk. If the healthy child is given a quart of milk, has butter on its bread, and meat or an egg once a day, he gets enough fat, and that which he receives is in wholesome form. It is well, therefore, not to give such fatty foods as pastry, fried meats and vegetables, and doughnuts or rich cakes, for in these the fats are not in so good a form for children, as experience has shown. If the child is constipated, the occasional use of cream or salad oil is desirable, for fat in abundance is laxative.

Bacon or salt pork, cut very thin and carefully cooked, may be given occasionally, but thick pieces with much lean are not desirable. In preparing bacon or salt pork it is very important not to burn the fat. To avoid this they should be cooked in one of the fol-

lowing ways: Put the slices on a broiler or wire frame over a pan; place the pan into a hot oven and cook long enough to remove most of the fat. Or keep a pan on purpose for cooking bacon on top of the stove, and let the fat which fries out of the bacon<sup>s</sup> collect in the pan, taking care that none is burned. In time so much fat will collect that bacon can be dropped into this hot fat; and it will be less likely to burn than if placed on a hot pan.

#### Food Group No. 4. Vegetables and Fruits

Two very valuable kinds of food are here grouped together, namely, vegetables and fruits. This is done because they are similar in that both kinds supply iron, lime, and other mineral matter to the body, and also mild acids (not always in such amounts that one can taste them), such as those which are found in oranges, apples and tomatoes.

Vegetables are an important but often a neglected part of a child's diet. They should be served at least once a day, as they help to keep the bowels in good condition. Several of the ways of accustoming the child to the taste of unfamiliar vegetables have already been suggested here. They may be used as flavoring for soups and stews, may be added to milk or meat stews, or served with meat gravy. If gravy is used, it should not be too fat nor made with scorched fat.

Young children may be given the young and tender parts of celery and lettuce, a satisfactory way of serving being in the form of sandwiches. For this purpose they should be slightly salted and the celery should be chopped or cut into small pieces.

All vegetables, whether cooked or served raw, should be washed with great care. Large vegetables like

potatoes and carrots should be scrubbed with a brush. Greens should be washed, leaf by leaf, under running water, or in a large amount of water. In the latter any sand which clings to them is likely to sink. To prevent it from again getting on the vegetables, lift them from the water instead of pouring the water off.

Most vegetables, when served as a separate dish, should be either steamed, boiled, baked, or stewed. If the supply of fresh vegetables is not generous, the juice in which they are cooked should be used with them as far as possible, or put into soups or stews.

Experience has shown that vegetables, particularly green vegetables, are at their best when cooked until tender, but not until completely wilted. Spinach requires cooking from 20 to 30 minutes.

Vegetables should be served either quite simply or with a little milk, cream, or butter, to improve or vary the flavor. As said before, oil may be served on greens instead of butter. These simple methods are better than complicated ones like frying or scalloping. For the smallest children such vegetables as greens should be finely chopped, and if the tougher portions of other vegetables, the skins of green peas, for example, are found to disagree with a child, these portions should be removed by putting the cooked vegetable through a sieve. No such vegetables as raw radishes or cucumbers, which might easily be swallowed in large pieces, should be given to small children.

Fruits, which with vegetables make up group 4, are also very important in the child's diet. They supply mild acids, and they are important for their flavor, for their laxative effects, and no doubt for other reasons also. This laxative effect is well recognized in the very general use of orange juice, prunes, and apples.



Then, too, the fruits, like the vegetables, have mineral elements which the body requires.

Fruits should be served in some form at least once a day. In general, the same rule should be followed as for vegetables in deciding in what form they should be served. Fruit juices and the pulp of cooked fruit, baked apples and pears, and stewed prunes, for example, are safest. Whether the skins should be given depends partly on the age and health of the child and partly on the way the fruit is prepared. If the skins are very tender, they are not likely to cause trouble, except with very young children. When apples and pears are baked the skins can be made tender by frequent basting.

### **Food Group No. 5. Simple Sweets**

Simple sweets are such things as lump sugar, maple sugar, sirups, honey, and plain candy, and those foods in which sugar is combined in simple forms with fruit juices (in lemonade, water ice, jelly, etc.), with flour or starch, as in plain cakes (cup cake, sponge cake, cookies), and with fruit, as in jams, marmalades, and similar things. Sweets which contain much fat, like rich cakes and pastry, and foods which are made rich with nuts or dried or candied fruits, or those which are highly flavored or spiced, can not be classed as simple sweets.

Sugar is a desirable part of the diet, and the only objection which can be raised to its use in reasonable amounts in a mixed diet is that it is sometimes allowed to take the place of foods which come under the first four groups mentioned in this bulletin, and so spoils the child's appetite for those other important things. Under these conditions it is harmful, because its improper use has led to bad food habits. Sweets should not be given between meals or during the first course of a meal. Careful mothers who

forbid their children eating candy at odd times sometimes give one or two pieces of wholesome candy as a "treat" with dessert at dinner.

### A Review

In the foregoing pages some general principles which should govern the young child's diet have been stated, and facts given about foods the child should have and about cooking them.

At the close of the day the mother might ask herself questions like the following to make sure that she has taken into account the things to which her attention has been directed:

Did the child take about a quart of milk in one form or another?

Have I taken pains to see that the milk that comes to my house has been handled in a clean way?

If I was obliged to serve skim milk for the sake of cleanness or economy, did I supply a little extra fat in some other way?

Were the fats which I gave the child of the wholesome kind found in milk, cream, butter, and salad oils, or of the unwholesome kind found in doughnuts and other fried foods?

Did I make good use of all skim milk, by using it in the preparation of cereal mushes, puddings, or otherwise?

Were all cereal foods thoroughly cooked?

Was the bread soggy? If so, was it because the loaves were too large, or because they were not cooked long enough?

Did I take pains to get a variety of foods from the cereal group by serving a cereal mush once during the day?

Did I keep in mind that while cereals are good foods in themselves, they do not take the place of meat, milk, eggs, fruit, and vegetables?

Did I keep in mind that children who do not have plenty of fruit and vegetables need whole-wheat bread and whole grains served in other ways?

Did each child have an egg or an equivalent amount of meat, fish, or poultry?

Did any child have more than this of flesh foods or eggs? If so, might the money not have been better spent for fruits or vegetables?

If I was unable to get milk, meat, fish, poultry, or eggs,

did I serve dried beans, or other legumes thoroughly cooked and carefully seasoned?

Were both vegetables and fruits on the child's bill of fare once during the day? If not, was it because we have not taken pains to raise them in our home garden?

Did either the fruit or the vegetable disagree with the child?

If so, ought I to have cooked it more thoroughly, chopped it more finely, or have removed the skins or seeds?

Was the child given sweets between meals, or anything that tempted him to eat when he was not hungry?

Was he allowed to eat sweets when he should have been drinking milk or eating cereals, meat, eggs, fruit, or vegetables?

Were the sweets given to the child simple, i.e., unmixed with much fat or with hard substances difficult to chew, and not highly flavored?

Was the child made to eat slowly and chew his food properly?

A young child may be considered well fed if he has plenty of milk, bread, and other cereal food; an egg once a day or its equivalent in flesh foods; a small portion each of carefully prepared fruits and vegetables, with a small amount of sweet food after his appetite for other foods is satisfied. If there is too much or too little of any of these, his diet is one-sided.



U. S. DEPARTMENT OF AGRICULTURE  
FARMERS' BULLETIN NO. 712

---

SCHOOL LUNCHES <sup>1</sup>

CAROLINE L. HUNT

Assistant in Home Economics, States Relations Service

and

MABEL WARD

Late Director of Home Science, Mississippi Industrial Institute  
and College

---

*Contribution from the States Relations Service*

*A. C. TRUE, Director*

---

INTRODUCTION

What should school children be given to eat at noon? What foods are best for the school lunch basket? The frequent asking of these questions shows that mothers and others interested in children's welfare have unusual difficulty in planning this meal. There are no scientific principles which apply to it more than

<sup>1</sup> Prepared under the direction of C. F. Langthworthy, Chief, Office of Home Economics.

NOTE.—This bulletin is of special interest to housekeepers throughout the country, particularly those with children of school age.

to the other meals, for, of course, choosing healthful foods and preparing them carefully are no more necessary at this than at either of the other meals of the child's day. Nor is it wise always to study one meal apart from the other two. The three taken together must, if they are to satisfy the needs of the growing body, supply several different kinds of food materials. It is seldom convenient to provide all of these at one meal, and those which are left out of one meal must be supplied at another. Breakfast, dinner or lunch, and supper should, therefore, usually be thought of together, as necessary to the making of a complete day's ration.

On the other hand, it is particularly difficult to live up to one's ideals in a meal which is almost always hurried and which must often be prepared in one place and served in another. The midday meal of school children on days when school is in session has, therefore, problems of its own and may well be occasionally discussed, as it is in this bulletin, apart from all other meals.

There are some places, small towns, for example, where dwelling houses and schools are so close together that pupils can easily go home at noon. In these cases the thought or care necessary for the noonday meal is along the same lines as that given to breakfast and supper. There are other places, however, and these include large cities as well as rural districts, where children are obliged, because of distance, to remain at school over the noon hour. Under these circumstances most children carry their lunches. Some, however, particularly in cities, are given money with which to buy food. This practice is, of course, open to dangers, for the money is too often spent in shops

or at pushcarts over which those who are most interested in the children's welfare have little control.

To insure that food is prepared under proper conditions, lunch counters or lunch rooms have been established in many school buildings, where pupils may buy full lunches or certain dishes with which to supplement food brought from home. There are schools, too, where the task of preparing lunches, or at least one or two of the dishes to be served at noon, is given to cooking classes as a laboratory or practice exercise.

Any discussion of lunches for school children must, therefore, take into account (1) the children who go home at midday, (2) those who carry their lunches, (3) those who buy them at shops or at the school, (4) those who are supplied by the school through the cooking classes, and (5) those who carry part of each day's lunch and depend on being able to buy something at or near the school to add to what they carry.

### **Foods for Children**

The essentials of the diet of all normal children are, of course, the same—namely, an abundance of simple foods carefully prepared and of sufficient variety to provide for activity, which in healthy children is almost ceaseless during waking hours, and for development into healthy manhood and womanhood. For this reason the general subject of food for children will be discussed before the special problems of the school lunch.

### **The Place of Bread in the Diet**

One of the chief practical food problems, whether children or grown people are concerned, is how to get good, wholesome, clean bread. It has been shown



that cereals provide nearly one-third by weight of all the food eaten by the American people <sup>1</sup> and that they supply nearly half of the protein (commonly referred to as tissue-building material) and nearly two-thirds of the fuel or energy. The greater part of these cereals is, of course, served in the form of bread of one kind or another. The quality of the bread which is eaten is, therefore, an extremely important consideration.

It is not possible within the limits of this bulletin to give directions for making bread, nor is it necessary, for recipes can be obtained from any good general cook book. All that can be done here is to speak of the qualities of good bread. These are perhaps most clearly and concisely stated in the score cards commonly used in bread-judging contests at State fairs, farmers' institutes, and elsewhere. Such cards are designed especially for judging loaves of wheat bread, but with a little modification they can be used also for breads made wholly or partly of other cereals (corn, rye, oatmeal, etc.) and for bread in other forms, such as biscuits and rolls. In all cases the characteristics of the crust and the crumb (the inside of the loaf), the lightness, and the flavor are taken into consideration.<sup>2</sup>

The crust should be crisp and deep (indicating thorough baking), but not hard or burned. The crumb should be elastic; that is, it should be capable of being compressed by slight pressure, but should spring back to its original form when such pressure is removed. If the dough is made too stiff, the crumb can not easily be compressed, and if too thin or if insufficiently baked, the crumb is soggy and inelastic. A crumb

<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Circ. 110 (1912). Food Customs and Diet in American Homes.

<sup>2</sup> Univ. Ill. Bul. 10 (1913), No. 25.

which is neither too hard nor too soft can easily be broken up in the mouth during the process of chewing, and will neither form a sticky mass nor be too dry to taste good.

Lightness is an important feature of quality. It depends on the size of the loaf as compared with its weight, a point which experienced bread makers can usually judge by lifting a loaf and by noting if the shape is symmetrical and the crust unbroken. When the loaf is cut, the air cells should be found evenly distributed, of about the same size throughout, and nearly round in shape. Cells which are higher than they are wide show that the bread has risen too much and is likely to be dry or sour. There should, of course, be no close, heavy streaks. In making bread, the best results are obtained by letting the loaves double their volume in the pan and by beginning the baking at such temperature that the rising will continue about 10 minutes in the oven.

The flavor of bread, which is determined by taste and odor, is difficult to define, except by saying what it should not involve—sourness and rancidity. The flavor of wheat bread is often described as that of the original wheat as it is obtained by chewing the grains. In like manner, the flavor of other breads should suggest that the original materials were in good condition at the beginning and that they have not undergone any undesirable changes during the process of bread making.

All of these qualities—lightness, good flavor, a crisp and deep crust, and an elastic crumb—can be secured in rolls and biscuits as well as in large loaves. The objection to hot bread is not due to the fact that it is hot (if it were, hot toast would be indigestible, i.e., cause distress), but that it lacks some of the charac-

teristics mentioned above. Large or thick biscuits, whether raised with yeast, baking powder, or soda, are likely, if cooked only a short time, to be soggy on the inside, and this, when it happens, is the objection to them, rather than the fact that they are served hot.

If the diet is limited in kind and quantity, bread made from the so-called whole-grain flours is especially useful; if the diet is varied and abundant, other foods can supply the nutritive material which characterizes the branny layer of the grain.

The use of different kinds of bread is to be recommended in general, for variety in the diet is pleasing, and this is an easy way to secure it. Sometimes so simple a change as baking the bread in a new form, a twist, for example, instead of a loaf, or cutting bread and butter in a fancy shape with a cookie cutter, will increase a child's relish for it. So, too, will a change of flavor, obtained by adding a few raisins, dried currants, or nut meats.

Cereal mushes and ready-to-eat cereal breakfast foods supply much the same nutrients as bread. In a very general way a half cupful of cooked cereal mush or 1 cupful of puffed, flaked, or shredded cereal is equal in food value to a good-sized slice of bread (1 ounce).

The above allowance of any one of these cereals with 1 tablespoon of cream is about equivalent to the slice of bread mentioned (1 ounce), spread with about one-sixth of its weight of butter, a moderate and not unusual allowance. Cereals with cream resemble bread and butter in their nutritive value more closely than cereals with milk do.

Probably one reason why bread and cereals in other



forms make up so large a part of the food of people is because they come near in themselves to fulfilling one of the important requirements of the diet—a right proportion between the nutrients which provide fuel only and those which can be used for body building. Or, expressing these in terms of the needs of the child, they come near to providing for activity and also for growth. To come near to doing a thing, however, is not to do it, and with bread and butter should be served, as a rule, some of those foods which provide protein in large proportion as compared with fuel. These foods include milk, meat, fish, poultry, eggs, cheese, dried beans, cowpeas, peas, peanuts and almonds, walnuts, and other nuts.

Among these protein-rich foods, as they are often called, healthy grown people may choose at will and according to their likes or dislikes, but in the case of children no one of them is thought wholly to take the place of milk.

### Milk and Ways of Using It

The value of milk in the diet of the young is due not only to the fact that it contains a large number of nourishing substances in forms in which they can easily be assimilated, but also to the fact that in some way not now fully understood it seems to promote growth and to help the body of the child to make good use of other foods.

While milk should, if possible, have a place in the diet of all growing children, it is not necessary to serve it at every meal, and the lunch can, if this seems desirable, be made an exception. In practice, however, it has been found that such dishes as milk toast, milk soups, and cocoa are often convenient for the

lunch at home, while at school they can be prepared more easily than most dishes, because they do not call for an oven or for any but the simplest cooking utensils.

Milk soups, of which there is a great variety, all prepared in about the same way, are important, not only because they can be made a means of serving milk in large quantities, but also because they offer a good way to use vegetables, the value of which as food is referred to later in this bulletin. Materials other than vegetables—small amounts of fish or cheese, for example—can also be used for flavoring. These, however, tend to increase the protein rather than to add the nutrients which give vegetables their special usefulness in the diet, a fact which should be kept in mind when bills of fare are being made.

It is unfortunate for those who have charge of the food of children to be tied down to any fixed recipes for milk soups, for if so they are likely to fail to utilize materials at hand, such as those that grow in the home or school garden or those that have been left over from previous meals and are still in good condition. General directions for preparation and also a few typical recipes will be found towards the end of this bulletin.

Other easily prepared dishes that may be the means of introducing milk into the diet are simple chowders, such as potato or corn chowder, and custards. The breakfast cereals—a large and varied class of foods, valuable in themselves—may be the means of encouraging children to take much milk. All can be served with milk; and the food value of the uncooked varieties can be further increased by using milk instead of water in preparing them. In this way skim milk, which has a higher food value than most people realize

and which is too often wasted, can be made to count as nourishment.

### Other Protein Foods

Other protein-rich foods should be used as well as milk in the diet of all children who have passed babyhood. Eggs are usually the first of these foods given in addition to milk. They contain much iron, an ingredient in which milk (though rich in other kinds of mineral matter, particularly lime) is lacking. Gradually, as the child develops, chicken, fish, meat, cheese, dried beans, peas, cowpeas, and other protein-rich foods, may be added. No great quantity is needed, inasmuch as bread and milk come near to supplying all the child's needs. These foods should not be overlooked, however, and in order to prevent this they should be thought of as forming a separate and important group of food materials which are to be drawn upon more and more as the child grows. Ways of introducing them into the diet, particularly into the school lunch, are given later.

### The Importance of Green Vegetables and Fruits in the Child's Diet

Vegetables and fruits are now considered a necessary part of the diet of the child. The reasons are many, but most of them may be summed up by saying that they furnish material needed to form bone and tissue and to regulate body processes. The mild acids which some of them contain help to prevent constipation; so, too, does the cellulose or fiber, especially when it is raw, though its value for this purpose may have been exaggerated in popular literature. Green vege-



tables are also a valuable means of introducing into the diet mineral matters, particularly iron, in a form in which the body can utilize them. Even at city prices, green vegetables have been shown to be an economical source of iron. Like the protein-rich foods, therefore, they should be looked upon as a separate and important group of foods to be drawn upon regularly.

The uses of fruits in the diet are much the same as those of green vegetables, though, unlike most vegetables, they have a considerable percentage of sugar, especially when they are dried, and sugar is a quickly absorbed fuel food. Like vegetables, they have value because they contribute some of the nitrogen required for tissue building and repair, and some energy. However, they are valuable chiefly because they supply growth-stimulating and body-regulating substances and also mineral matter needed for bone and for many other purposes. The quantity of these materials in fruits and vegetables is small, it is true, but large in comparison with the amount in many other common foods.

Fresh vegetables and fruits must be prepared with care, for there is danger of transmission of disease by means of foods that are served raw. Most people will agree that apples, pears, etc., as picked from the tree in an orchard far enough from the road to escape dust, are clean. If they drop to the ground upon clean grass they may still be eaten without much risk, although there would then be more chance for dirt, with its attendant disease-producing bacteria.

All fresh fruits and vegetables which come from the market should be thoroughly washed in several waters. Most fruits may be safely dipped in boiling water and

many can be kept there for several seconds without injuring their flavor. This kills many, if not all, of the bacteria and other organisms that are likely to cling to the fruit. A convenient way to do this is to place the fruit in a wire frying basket. Grapes, apples, pears, peaches, and plums are not injured by this treatment, and unripe strawberries are often improved by it. Large fruits, such as bananas, apples, oranges, and others with unbroken skins may be safely washed with soap.

Dried fruits should be particularly well washed. If they are then put into a warm oven to dry, they are likely to absorb the water which clings to them and thus to be softened and improved in taste.

### Desserts and their Selection

The dessert for any meal usually consists of fruit, either raw or cooked, of sweets, or of pastry. Most children like fruits, raw, cooked, or dried, and so they are very useful for dessert for them. Even here, however, variety should be considered, and the less common uses for fruits are worth noting. For example, in a certain boarding school the children are given daily a food resembling candy, which is made of finely chopped dried fruits and nuts mixed together, rolled out, and cut into squares like caramels. These are very palatable and nutritious and are believed to prevent constipation. (See recipe for Fruit and Nut Confection, on p. 705.)

Pies and other kinds of pastry add much fat to the diet, the amount of fat in many kinds of pie (taking crust and filling together) being more in proportion to weight than in any meat but the very fattest. Most

authorities on food believe that it is better to serve fat to the children in the form of butter, milk, cream, egg yolks, or uncooked salad oils than in the form of rich pastry or rich sweets—i.e., desserts that are heavily sweetened and also very fat.

Experience has shown that fruits, fresh or served in simple forms (baked, stewed, or raw), and simple sweets are better forms of dessert for children than preserves or rich pastry. Sweets may be given in the form of cake (not too rich or it comes in the class of pastry), cookies, sweet sandwiches, simple candy, honey, dried or preserved fruits, maple sugar, and loaf sugar, and in many other ways. Highly flavored and spiced foods should be avoided because they spoil the appetite for simple flavors.

### Foods Conveniently Grouped

Going back over what has been said about the kinds of foods desirable, the subject may be summed up by saying that the important elements of a child's diet are milk, supplemented at times by other protein-rich foods but never wholly omitted; bread, or cereal food in other forms; butter or other foods containing much fat; vegetables and fruits; and sweets. In general, it may be said that the school lunch, like the diet as a whole, should contain representatives of the following groups:

*Group 1. The Protein-rich Foods.* Milk; cheese; meats (except the very fattest); fish; poultry; dried beans, peas, and cowpeas; peanuts; and others. The reasons for including peanuts are their high percentage of protein and the fact that in finely divided form they are used as sandwich filling. Other nuts are



rich in protein but are at present seldom used in the child's diet in sufficient quantities to make it necessary to enumerate them here.

*Group 2. The Cereal or Starchy Foods.* Breads, cereal mushes, ready-to-eat cereal breakfast foods, rice, macaroni, tapioca, and others.

*Group 3. The Fatty Foods.* Butter, cream, salad oils, bacon, and others.

*Group 4. Vegetables and Fruits.* Here some confusion may arise because the term "vegetable" is sometimes used to mean all foods of plant origin and in this sense would include cereals, dried beans, and other foods which have been classified elsewhere. As here used it applies only to those which are used as side dishes with meat, or as salads and in similar ways—to potatoes, greens, lettuce, celery, green peas and beans, carrots, asparagus, and others. Under this heading come also all cooked or raw fruits, with the exception of those to which much sugar has been added (preserved or candied fruits, marmalades, and others), and dried fruits in which the percentage of sugar is high because most of the water has been driven off. Such sweet fruits are more properly classed under group 5.

*Group 5. Simple Sweets.* Cakes and cookies which contain little fat; cane sugar; plain candies; maple sugar; sweet chocolate; jellies; preserved fruits; jams; marmalades; honey, molasses, and other sirups; dried figs, dates, raisins, and other dried fruits, and similar foods are members of this group.

If, as a general rule, each of the above groups is represented, the diet is likely to contain all the important nutrients—protein, fat, starch, sugar, mineral matters, and growth-stimulating substances—in reasonably cor-

rect proportions, and to have an energy value sufficient for the child's needs. If all groups are represented no one kind of foods is likely to be used in excess.

The food materials which are regularly used in the household are so many and so varied that they can not, of course, be perfectly classified under a few heads. It would be difficult, for example, to say where dried beans belong, for they have much protein and also much starch. Mutton would naturally come under the protein-rich and also under the fat foods. In spite of such difficulties, there are many advantages about such a grouping system as that mentioned above. One is, that it leads the mother or housekeeper to think of the special value of each of the group and prevent her from omitting representatives of any of them from her bills of fare for any long period. It is likely to prevent her, for example, from making up a lunch which consists only of starchy foods and sweets (breadstuffs and cake), as so many lunches now do.

It should prevent her also from serving meat and eggs, or meat, eggs, and milk at the same meal, with no fresh vegetables or fruit. Again, it prevents the omission of members of one group without some very good reason. In general, economy is most likely to be necessary in the protein-rich foods and in the fruits and vegetables, for these are usually high priced. Among the first mentioned are such foods as dried beans, peas, cowpeas, peanuts, walnuts, and pecans, as well as eggs, milk, cheese, and flesh foods; and often, though by no means in all cases, the vegetable foods in the group are cheaper. To learn, therefore, to prepare attractively the lower-priced members of

the group is far better than to omit the group entirely in order to save money. The same may be said of fruits and vegetables, which could be raised in the home garden more often than they are, or gathered in the woods by children as a school exercise.

A meal in which all of the important kinds of food are represented tends to keep the child in good condition and to give him good habits of eating. The liking for a large range of foods is desirable from the standpoint of diet and also of manners, for it helps to prevent a person from becoming a disagreeable table companion—one who is “fussy” about his food. Meals that are carefully planned help also to give the child some little idea of what those who know most about foods have in mind when they speak of a possible “balanced”—or better, a “rightly chosen”—ration. With children it is far more important to suggest the value of such a ration by the character of the meals given to them, than to try to tell them what it is or to what extent it has been worked out.

### The Noon Meal at Home

There is no reason why the ordinary family dinner should not be suitable for school children or served in a way that adapts it to their needs. The usual first course of meat and vegetables contains nothing, except the meat, which can not be given even to the youngest children. The vegetables, providing they are carefully prepared by simple methods, are specially needed and can often be made attractive to children by being served with a little meat gravy. As a substitute for the meat itself, milk can be provided in the case of the younger children. These articles, with the bread and butter, provide most of the food needed.



The dessert course is suitable for children as well as for grown people unless it consists of rich pastries or puddings. The latter are not considered wholesome for children, if for no other reason than that they are likely to lead to overeating. Such desserts as fruit, fresh or cooked, with cake; cereals with milk or cream and sugar; custards and custard puddings; gelatin dishes; simple ice cream; water ices; and other simple desserts may be given.

Whether or not the family meal is healthful for children depends not only on the food materials selected, but also on the way in which they are cooked. Simple methods are to be preferred from the standpoint of health as well as from that of the housekeeper's time. All dishes that are likely to contain overheated and scorched fats, such as foods carelessly fried in a pan in a small amount of fat, should be avoided. Deep-fat frying is open to fewer objections since, if properly done, foods will absorb little fat and the fat will not scorch. Vegetables cooked in water or in their own juices and seasoned with salt and a little butter or cream, are easier to prepare than those that are served with white sauce, scalloped, or cooked in other elaborate ways.

What is said above applies equally to all meals. There is, however, one special precaution that applies to the noon meal when it is hurried. This refers to tough, hard foods that are likely to escape proper mastication. It is a mistake to think that the foods given to children must always be soft or finely divided, for children's teeth need exercise quite as much as their muscles do. When time for eating is limited, however, it is well to omit foods that are difficult to chew, and in extreme cases it may be necessary to serve

only soft or finely divided foods—sandwiches made from crustless bread with finely chopped fillings, for example. Before resorting to this, however, it is well to make sure that the time for eating and for insistence on good table manners is not unnecessarily cut short. The advantage of putting the meal on the table promptly and of having foods served in individual portions, or at least ready to eat when they are brought to the table, should be kept in mind. To have the meat already sliced and the dessert in cups instead of in one large dish from which individual portions must be served, and to follow the same general plan with other foods may change a hurried meal into one at which there is plenty of time for attention to details essential to health and good manners.

If special lunches, different from those prepared for the family in general, are to be given to school children, the following are suggested as bills of fare. They are only typical and many others might be given which would be just as good.

### Suggested Bills of Fare for the Home Lunch

1. Eggs, boiled, coddled, poached, or scrambled; bread and butter; spinach or other greens; cake.
2. Beef stew with vegetables; milk; crisp, thin tea biscuits; honey.
3. Dried bean or pea purée; toast; baked apple; cookies.
4. Vegetable-milk soup; zwieback; rice with maple sugar and butter, or with milk or cream.
5. Potato chowder; crackers; jelly sandwiches.
6. Cold meat; creamed potatoes; peas; bread and butter; frozen custard or plain ice cream and plain cake.
7. Lamb chop; baked potatoes; bread and butter; sliced mixed fruits; cookies.
8. Baked omelet with spinach, kale, or other greens; bread and butter; apple sauce; cake.

9. Milk toast; string beans; stewed fruit; cake.

10. Boiled potatoes; codfish gravy; bread and butter; lettuce; custard.

### The Basket Lunch

The basket lunch is harder to plan and also to prepare than the lunch at home. To begin with, there are many foods which can not be included in it, either because they are not good cold or because they can not be conveniently packed or easily carried. This leaves fewer foods to choose from, and so extra care is necessary to prevent sameness. Extra care is needed, too, in the preparation of foods that must be packed in small compass and kept for several hours before being eaten, and that must very often be carried over dusty roads.

On the other hand, the number of foods that can be easily carried has been enlarged of late by the possibility of using paraffin paper and parchment paper, in which moist foods can be wrapped so as to prevent them from sticking to other foods. Paper cups, jelly glasses, and so on, are also a help; for in them sliced raw fruits, stewed fruits, custards, cottage cheese, and other half-solid foods can be carried.

The quality of the bread used in the basket lunch is especially important, because it is commonly served in the form of sandwiches and is, therefore, to be considered not only as a food in itself but also as a means of keeping other much-needed foods in good and appetizing condition, or of serving them in attractive ways.

Variety in breads, too, is more important at this than at other meals because of the danger of monotony. Wheat bread, whole-wheat bread, corn, rye, or oatmeal breads; nut, raisin, and date breads; beaten biscuit, rolls, crisp baking powder biscuit, or soda biscuit, and toast, zwieback, and crackers may be used in turn



to give variety. Rolls hollowed out can be made to hold a large amount of sandwich filling, which is an advantage at times.

### Packing the Lunch

Many kinds of lunch boxes, pails, and baskets are now on the market. The chief advantage of most boxes and pails is that they are made of metal, and can, therefore, be easily cleaned and scalded to keep them in safe condition. Some boxes have the advantage over pails that they can be folded when empty and strapped with the school books. Baskets are ventilated, and for this reason suitable for carrying moist foods which are likely to spoil. There is no reason, however, why small holes can not be punched in metal boxes or pails to let in the air. Baskets can, of course, be washed or scalded, but not so easily as metal containers, and they should be frequently cleansed. There should, in fact, be no part of any food container that can not be cleaned. For this reason the simplest boxes and baskets are often better than the more elaborate ones with compartments in which to keep dishes, knives, forks, and spoons. With the increase in automobile travel, well-constructed boxes and baskets which can be easily cleaned have come on the market, with compartments for keeping food hot or cold and for holding liquids. These are, of course, suitable only for children who ride back and forth, and particularly suitable where several lunches are put up in one household.

The precautions which must be taken to keep foods clean and safe differ with circumstances. In dusty seasons they should be wrapped particularly well.

In hot weather the use of soft, moist foods in which molds and bacteria are most likely to grow rapidly should be avoided. Although chopped meat moistened with a dressing of some kind makes a good sandwich filling, such foods are less desirable in hot weather than slices of meat, peanut butter, or other foods less liable to spoil.

Paper napkins or the somewhat heavier paper towels of much the same size are very useful for packing lunches, and, like paraffin and parchment paper, may now be obtained at a low price, particularly if bought in rather large quantities. If no provision is made in the school for serving lunches, an extra napkin, either of paper or cloth, should be put in the basket, to be spread over the school desk when the lunch is eaten. Napkins can be made out of cotton crêpe at a cost of a very few cents each. The crêpe may be bought by the yard, and should be cut into squares and fringed. Such napkins have the advantage of not needing to be ironed.

In packing the lunch basket put at the bottom the things least likely to crush, and wrap the sandwiches, etc., into neat parcels, not all in one. Paper cups; jelly tumblers with covers, which can now be bought in several sizes; bottles with screw tops, such as those in which candy and some other foods are sold; and small jars such as those in which some goods are sold by druggists, can all be used for packing jellies, jams, and honey, as well as the foods mentioned above. When clean and in good condition, empty receptacles of this kind can be saved for use in the lunch basket.

A few bills of fare for basket lunches follow, which may help in deciding what is satisfactory for the purpose. Many others equally good could be suggested.

### Suggested Bills of Fare for the Basket Lunch

1. Sandwiches with sliced, tender meat for filling; baked apple, cookies or a few lumps of sugar.
2. Slices of meat loaf or bean loaf; bread and butter sandwiches; stewed fruit; small frosted cake.
3. Crisp rolls hollowed out and filled with chopped meat or fish, moistened and seasoned, or mixed with salad dressing; orange, apple, a mixture of sliced fruits, or berries; cake.
4. Lettuce or celery sandwiches; cup custard; jelly sandwiches.
5. Cottage cheese and chopped green-pepper sandwiches or a pot of cream cheese with bread-and-butter sandwiches; peanut sandwiches; fruit; cake.
6. Hard-boiled eggs; crisp baking-powder biscuits; celery or radishes; brown-sugar or maple-sugar sandwiches.
7. Bottle of milk; thin corn bread and butter; dates; apple.
8. Raisin or nut bread with butter; cheese; orange; maple sugar.
9. Baked bean and lettuce sandwiches; apple sauce; sweet chocolate.

### Lunches Partly or Wholly Prepared at School

The basket lunch must usually be prepared at a time when the housekeeper is very busy. In places where there are shops near the school, therefore, children are sometimes given pennies with which to buy food at noon. They like this, of course, for it is a pleasure to make their own selections and they are glad to be relieved of carrying baskets. If they could choose wisely, there would be no objection to this plan, and it might be made good training in handling money and keeping accounts. In practice, however, it is found that the money is often spent in unclean places and for unwholesome foods; pickles and pies; or, at best, starchy foods and sweets are likely to make up the bill of fare, and in this way the good effects of careful feeding at



home are likely to be overcome. In many places, therefore, the schools are beginning to serve noon lunches or one or two dishes which can be eaten with food brought from home.

Mothers are interesting themselves in this work, not only because of its effect upon the health of their children but also because of its relation to education for home making. In their own homes they try to serve wholesome food and also to train their children to good habits in eating. They realize, however, that the meal at school is in some ways a better opportunity for training than those served at home. Unlike the other meals of the child's day, it is eaten during the hours which are set apart for education. The child's mind is, therefore, in a receptive condition, and every precaution which is taken to adapt the lunch to his physical and mental needs is likely to teach a lesson in food and nutrition, silently, to be sure, but effectively. Mothers recognize, therefore, that the lunch at school may be of assistance to them in one of their special tasks. They are recognizing, too, that the preparation and serving of lunches at school may improve the quality of teaching in home economics. Instruction in cookery as an art is, of course, most successfully given where there is a large supply of food materials and of utensils to work with and where the work itself is done with some useful and practical purpose in view. The lunch at school may, therefore, be considered a means of strengthening the courses in cookery and allied subjects. In many places it has already been introduced and is proving valuable in many ways.

It is evident from what has been said about foods in general that there is no reason why suitable lunches

for children should not be supplied, even in places which serve only 5 out of 21 weekly meals, and which for that reason can not afford elaborate cooking apparatus. There are few localities where good bread can not be purchased either from public bakeries or private housekeepers. The special dishes needed to provide for "tissue building" may well be meat and vegetable stews, cocoa, milk soups or chowders, or purées of dried beans or peas, or other dishes of a similar character, which require no oven for their preparation and only the simplest cooking equipment. Though these dishes are especially suitable because they are served hot, sandwiches with fillings of meat or meat substitutes like those mentioned in connection with the basket lunch, are by no means out of the question, even where cooking facilities are limited. It should be possible also to sell the children milk to drink, though, if this be done, the greatest watchfulness is required on the part not only of those in charge of the lunch room, but also of health officers.

The amount of protein offered for a given sum in the milk dishes mentioned above, may be increased by the use of skim milk, which, as a matter of fact, has slightly more protein and mineral matter, volume for volume, than whole milk. A soup made with skim milk will contain, of course, more of these nutrients than one made with whole milk and water, half and half. However, the fact should always be kept in mind that skim milk has been handled more than whole milk, and that for this reason it is more likely to have become contaminated. Extra precautions are therefore necessary when it is used. Clean skim milk ought to be easily and cheaply obtained in country schools near farms where good cream is sold.

Fruits and raw vegetables are permissible wherever there is a good supply of water in which to wash them and care is taken to do this. Sweets are, of course, the easiest of all foods to obtain, since they are manufactured on a large scale and very commonly sold.

### Simple Bills of Fare for School Use

Some simple bills of fare follow. Many others equally good could be suggested.

1. Vegetable milk-soup; crackers; rolls; fruit; plain cake.
2. Meat and vegetable stew; bread and butter; sweet chocolate.
3. Boiled custard; lettuce sandwiches; fruits; cookies.
4. Dried codfish chowders; crackers; fruit; maple-sugar sandwiches.

However the school lunch is prepared, it will meet the needs of children who wish to bring part of their lunches, if it contains those foods which are most difficult to carry. It is an easy matter to carry bread and butter and sweets. It is the liquid foods like milk, and such foods as cooked fruits, and soft fruits like berries which, though valuable, contain very little nourishment in comparison with their bulk, that cause most trouble. It happens, however, that these foods which are most likely to be needed in connection with what is brought from home are among those which must be handled with the greatest care. For this reason schools are beginning to feel responsible even for the children who buy part of their lunches only.

In the above bills of fare, the first item and the fruit can easily be served by the school, and the others can be brought in the lunch basket. These bills of fare can therefore be used by those who bring part of their lunch. Where there is an oven and abundant cooking



facilities the bills of fare for simple lunches prepared wholly or partly at school, on page 691, may be followed at school as well as at home.

### Lunches Served by the School

While the carrying of lunches is still by far the most common practice, taking country and town together, there are few cases in which it is not thought desirable for the school to share with the home the responsibility for the noonday meal. In some places the task for the school may be hardly more than that of providing clean and safe places for lunch baskets, where the food will not be likely to become dirty or to spoil. In others it may be practicable to provide, by one means or another, a hot dish with which to supplement foods brought from home. In still others, particularly where large attendance and many teachers and other workers make subdivision of labor a comparatively easy matter, it may be possible for the school to establish and maintain lunch rooms.

### Costs

Whenever the matter of school lunches is under discussion in a community the cost must be carefully counted. Experience in rural as well as city schools has shown that expenses may be classified under the four heads: Equipment, food materials, service or hired help, and supervision. In a matter of this kind, which, from the housekeeper's standpoint, is closely related to her own problems of nutrition, the question naturally arises, What part of the expense should the school be expected to meet? It is almost universally agreed that the cost of the food materials should be

covered by the sale of food, and that it can be if a charge of a few cents is made for each dish. The equipment for the lunch room is usually paid for by the school board or by some organization of parents and patrons formed for the purpose of cooperation with the school. Sometimes pupils themselves raise the necessary money by means of entertainments given in the school. The cost of upkeep and new utensils, which is not often large, can usually be met from the profits on the sale of food. This leaves only the two items of service and supervision.

Service, as a rule, is reduced to a minimum, even in large city schools. Pupils are provided with trays, and foods are so placed on a counter or table that they can wait on themselves. In some schools they are expected also to return the soiled dishes to an attendant. In some schools where cooking is taught, the amount of hired help is still further reduced, for the members of the cooking classes prepare and serve the lunches under the direction of the teacher as part of their class work.

The supervision of lunches is, under all circumstances, a most important matter, which bears vitally upon the problem of health in the home, for upon it depends the character of the foods selected and the cleanliness of the methods by which they are prepared and served. In this connection the report of a successful experiment in school feeding in a large city says:

The school lunch differs from the street lunch [bought at pushcarts or small shops] not only in the quantity and quality of food which children get, but also in the ideas about food which they get. Every time a child buys food he gets with it an idea about food. On the streets he gets an inferior product and a harmful idea and a low standard of food quality and care; in the school he gets a wholesome product and, if properly planned, a helpful idea about food and its care

Supervision aims to insure this educational value for the school lunch, as well as to guarantee the wholesomeness of the lunch itself. Any means which will give children wholesome and helpful food standards are worth trying, and expense incident to such a plan may properly be charged against education and met by the public treasury.

In large cities a trained supervisor is often employed for all the lunch rooms connected with the school system. In smaller places it is customary for the teacher of domestic science to supervise the school lunch. Where the importance of the task is recognized and due allowance is made for it in planning the program of the teacher, there is no objection to this practice. On the other hand, in schools where this arrangement is adopted there is the best opportunity for making the cooking classes and the lunch room mutually helpful. Even the teacher of general branches is considered better prepared for her work if she knows something about the hygiene of foods and is prepared to supervise a lunch, as the introduction, into teachers' training schools, of courses in home economics testifies.

### Special Problems of the Rural School Lunch

It is in the small country school with only one teacher that the midday meal presents the most difficult problems. The common custom is still for the pupils to bring their lunches, but there is a growing tendency to try the experiment of preparing part of the meal at school and of allowing time for serving it carefully. If rightly handled, the meal, even under the unusual difficulties presented in the rural school, may offer the most favorable of all opportunities to inculcate habits of cleanliness and to teach sanitation and simple cookery. The situation, however, will require a teacher



of ingenuity and of enthusiasm for her work. The simplest of equipments includes a large kettle suitable to be used on the stove which heats the schoolhouse, measuring cup and spoons, paring knife, mixing spoon, dish pans, and towels. It will usually be possible for the boys to make a set of shelves for the dishes, using box lumber if no other is available, and for the girls to make curtains or other coverings for the protection of the dishes from dust. The pupils will, as a rule, be found willing to bring plates, cups, bowls, and spoons from home, if this is necessary in order to keep down expenses. A fireless cooker can easily be made by the pupils as a class exercise.<sup>1</sup> In this a hot dish for lunch can be prepared before school. The fireless cooker is convenient for meat stews, meat and bean soups, cereal mushes, and many other dishes which require long cooking.

The recipes for the dishes to be cooked for lunch may be given to the older girls in school, discussed in class, and tried at home. The special dish for the day, which in winter is usually hot and in summer more often cold, can be prepared and served at noon by the girls in turn, working in groups. It will often be necessary to serve the food to the children at their seats, a practice which is not especially objectionable if the schoolhouse is clean and well ventilated and the desks are carefully cleaned before meals, as suggested elsewhere, and the building thoroughly screened to keep out flies, which are always dangerous around food, since they can convey to it the bacteria which cause intestinal and other diseases. At seasons when there are no flies and on days when the weather is favorable it is a pleasant change to serve the lunch out of doors. Clean

<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Syllabus 15 (1914).

hands should always be insisted upon, as well as clean spoons, dishes, etc., and individual drinking cups. Furthermore, children should be taught not to drink out of each other's cups or glasses or to use each other's spoons or forks.

The question of good food and a safe water supply can not be separated. Besides being used for drinking, the water at the schoolhouse is used for washing the hands, and if any part of the lunch is prepared there, it is used in cooking and in washing dishes, and if it has in it any of the tiny forms of life which carry disease, the pupils may be infected by using it in any of these ways. In schools in cities which have a good water system there is, of course, less danger than in the country, where dependence must often be placed on surface wells. When that is the case, too great precautions to provide pure, safe water either at the school or on the farm can not be taken. When there is any question of its purity, all that is used for drinking, cooking, and washing should be boiled.

It is seldom desirable to prepare more than one dish a day in a small school, and this should, for the sake of variety, differ from day to day. The others can be brought from home. Or ready-to-eat foods (bread, crackers, fruit, or cakes and cookies) can be bought to round out the meal, some one in the neighborhood being usually ready to make such foods for sale if there is no shop where they can be obtained. The choice of the dish to be cooked should be determined partly by what it is possible to do in the way of cooking at the school, partly by what purchased or home-grown food is available, and what the school garden or neighboring fields or woods afford, and partly by what the teacher has learned, from experience, is needed to go

with the foods brought from home. The noonday meal as a whole will then be appetizing and will provide all the needed nutrients as they are now understood.

### A Few Recipes for School-lunch Dishes

Most housekeepers have collections of recipes for dishes of all kinds, but probably few have attempted to compile lists of dishes suitable for school lunches. A few such recipes, therefore, given here, may be suggestive.

#### Milk Soups

The ingredients of milk soups may be grouped under four heads: (1) A liquid; (2) a starchy substance used for thickening; (3) a fatty substance; and (4) flavoring. The liquid may be milk, either whole or skim, or a mixture of two or more of the following in any proportion: Meat stock, water, cream, vegetable juice, including pulp. The starchy substance may be flour, cornstarch, or potato starch. The proportions are usually three-fourths of a level tablespoon of flour and an equal amount of butter to each cup of liquid. If starch is substituted for flour,  $\frac{1}{2}$  tablespoon to a cup will usually be found sufficient. An interesting school exercise may be arranged by having students make potato starch and use it for thickening these soups or in other ways.

The following recipes for soup and chowder will serve six children generously.

#### CREAM OF PEA SOUP

1 can peas or 1 quart fresh peas.	2 tablespoons flour.
1 pint milk.	1 teaspoon salt.
2 tablespoons butter.	$\frac{1}{4}$ teaspoon pepper.



Heat the peas in their own liquor, or cook them in boiling, salted water until tender. Drain off the liquid and rub the peas through a strainer. Scald the milk and add to it the butter and flour rubbed to a smooth paste. Cook 1 minute, add the peas, salt, and pepper. Boil for a few minutes and serve at once.

### CREAM OF TOMATO SOUP

1 pint or 1 can tomatoes.	1 quart milk.
2 tablespoons butter.	Sprig parsley.
1 tablespoon flour.	$\frac{1}{4}$ teaspoon white pepper.
1 teaspoon sugar.	$\frac{1}{2}$ teaspoon soda.
1 teaspoon salt.	

Cook the tomatoes slowly with the flavorings for 10 minutes, and rub through a strainer. Scald the milk, thicken with the flour and butter rubbed to a paste; reheat the tomatoes and add the soda; combine with the milk and serve at once.

### QUICK TOMATO SOUP

1 pint or 1 can tomatoes.	1 teaspoon salt.
1 quart water.	$\frac{1}{4}$ teaspoon pepper.
4 tablespoons butter.	1 tablespoon chopped onions.
4 tablespoons flour.	

Mix the water, tomato, and seasonings. Heat to the boiling point; add butter and flour rubbed to a paste, and cook a few minutes. Strain and serve.

### Chowders

Fish or clam chowders and oyster stews, though common and suitable in regions where fresh sea food is abundant, would not be readily obtainable dishes for school lunches in many localities. There are, however, certain similar dishes which can easily be prepared in the school and which are attractive and wholesome. The ingredients are milk, whole or skim; a fatty substance, which is usually salt pork, though butter may be used; potatoes or crackers, often both;

and, in addition to these, one of the following: Fish, which may be either fresh or salt; green corn, fresh or canned; parsnips, vegetable oysters, kohlrabi, or celery. A chowder consisting mainly of milk, potatoes, and crackers, and flavored with a little salt codfish is perhaps the most economical of these dishes.

### SALT-CODFISH CHOWDER

1½ ounces or 1½ cubic inches fat salt pork.	1 quart milk.
1 tablespoon chopped onion.	½ pound salt codfish, or just enough to flavor.
3 cups potatoes, cut into small pieces.	¼ pound crackers.

Break the codfish into small pieces, and soak it in lukewarm water until it is soft and the salt has been removed. Cut the pork into small pieces and cook it until a delicate brown, adding the onions during the last part of the cooking. To the pork and onions add the potatoes; cover with water and boil them until tender. Add the milk and fish, and reheat. Add the crackers shortly before the chowder is served.

### CORN CHOWDER

The same general directions can be followed for making corn chowder as for making salt-codfish chowder. One can of corn or 1 pint of fresh corn is sufficient for the amount given above. If fresh corn is used, it should be cooked with the potatoes.

### VEGETABLE CHOWDER

Any one, or a combination of two or more of the vegetables already considered, may be used as suggested for fresh corn (i.e., cooked with the potatoes) in making a chowder.

### POTATO CHOWDER

6 medium-sized potatoes, sliced.	1 tablespoon flour.
½ pound salt pork, cut into dice.	1 pint milk.
1 tablespoon chopped onion.	1 pint water.
1 tablespoon butter.	1 teaspoon salt.

Fry the pork and onions together until both are a delicate brown. Put a layer of the sliced potatoes into a kettle, then a layer of onions and pork, and sprinkle with salt. Repeat this until those materials are all used. Pour over them the grease from the pan in which the pork and onions were fried and add the water. Cover and simmer 20 minutes, or until the potatoes are tender. Thicken the milk with the flour mixed with the butter and pour it over the potatoes. Stir carefully, so as not to break the potatoes. Serve very hot.

### Brown Stew

For this dish the cheaper and less tender cuts of beef, such as the rump and round, can be used. Remove the meat from the bone and cut it into small pieces. Dredge with flour, and cook it in a small amount of fat until it is well browned. Add hot water, about 1 quart to every pound of meat; season with salt, pepper, and onion; and cook slowly for an hour. The meat should be very tender and the gravy thick. Tomato and other vegetables may be added while the stew is cooking. An allowance of 1 pound of round steak for 10 children will, according to a general estimate, equal in protein value a glass of milk for each.

### Soups Made from Dried Beans, Peas, or Cowpeas

There are a great variety of soups of high nutritive value that can be made from dried navy beans, black beans, lentils, cowpeas, or other legumes. The vegetables should be first soaked in water for several hours, overnight being usually the most convenient time. When they are thoroughly soaked, the water should be poured off and fresh water added. They should then be cooked until tender, with a little onion, celery, or other highly flavored vegetable, and salt, then put through a strainer to remove the skins. The juice and pulp should



then be either diluted or boiled down to the proper consistency for a soup, and should be bound with a mixture of flour and butter, as milk soups are. An ounce of dried beans is very nearly equal in protein value to a glass of milk, though the protein is not so completely digested.

### Greens

Greens should be thoroughly washed in several waters. A good rule to follow in washing, and also in removing cooked greens from the water in which they have been cooked, is to lift the greens out rather than to pour the water off. When the water is poured off, the sand and grit which have sunk to the bottom of the pan are likely to get on the greens again. To preserve the color of greens add about  $\frac{1}{8}$  of a teaspoon of soda to each quart of water in which they are cooked; to preserve flavor avoid cooking longer than necessary to make them tender. Remove the greens from the water and season with salt and a little pepper; or reheat with a little fat or butter. The addition of butter, cream, oil, or savory fat to the cooked greens increases nutritive value and also improves flavor.

### Boiled and Coddled Eggs

The most common way of preparing eggs is by cooking them for 3 minutes in boiling water. By this process the yolk is left entirely uncooked and the white is more cooked than many people think desirable. A better way is to place the eggs in hot water, remove them from the stove, and allow from 6 to 8 minutes for cooking. Much will depend upon the temperature of the eggs and the amount of water used. In most cases, however, the following method will be found satisfactory: Bring to the boiling point 1 cup of water

for each egg to be cooked, put the eggs into the water, remove from the fire, and cover the pan closely. Leave the eggs in the water for from 6 to 8 minutes. "Hard boiled" eggs can be prepared in the same way by allowing a longer time.

### BAKED OMELET WITH GREENS

1 quart or $\frac{1}{2}$ pound spinach, kale, Swiss chard, or other greens.	$\frac{3}{4}$ cup liquid (milk, cream, water, soup stock, vegetable juice, or a mixture of two or more of these).
$\frac{1}{4}$ cup butter or other fat.	4 eggs.
$\frac{1}{3}$ cup flour.	1 teaspoon lemon juice or vine- gar.
1 teaspoon salt.	
$\frac{1}{8}$ teaspoon pepper.	

Wash the greens with great care, boil until tender (which will take 20 to 25 minutes) in the least possible amount of water; drain and chop fine. A meat chopper will be found convenient for the purpose. Melt the butter, add the flour, and cook for about 1 minute. Add the milk, stirring constantly, and cook until the mixture is smooth and thick. Add the chopped greens and the egg yolks, unbeaten. Beat the whites of the eggs stiff and add them to the other mixture by the cutting and folding process. Pour into a buttered baking dish and cook in a slow oven for 30 minutes, or until firm and brown. Serve at once.

### Rice or Macaroni and Cheese

Boiled rice or macaroni can be heated, with enough grated cheese added to flavor it. If preferred, it may then be browned in the oven before serving.

### Bean, Pea, or Cowpea Loaf<sup>1</sup>

Any of the dried vegetables mentioned in the recipe for Chowders can be made into a loaf. They should be

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 559 (1913).

soaked and thoroughly cooked as for the soup, but with less water, and it is well not to add the seasonings until the vegetables have been put through a sieve. Then chopped celery, green peppers, onions, pimentos, or grated cheese can be added and the mixture browned in the oven. This dish can be served either hot or cold.

### Sauces

There is a great variety of sauces, which can be used in the home to serve with meat or vegetables and can also be used in making sandwich fillings. In a general way, they are made like milk soups, excepting that more flour is used. Two tablespoonfuls of flour and 2 tablespoons of butter or other fat are usually allowed for each cup of liquid. This liquid may be water, broth, tomato juice, milk, cream, the water in which vegetables have been cooked, or a combination of two or more of these.

### TOMATO SAUCE

1½ cups tomato juice.	1 slice of onion.
2 tablespoons flour.	Sprig parsley.
2 tablespoons butter.	½ teaspoon salt.
⅓ teaspoon pepper.	

Add the seasonings to the tomato juice, and simmer until the liquid has been reduced to about 1 cup. Melt the butter in a saucepan, stir in the flour, and when this is smooth add the strained tomato juice. Cook for a few minutes or until smooth and thick. The tomato juice may be used plain, omitting the first cooking with the seasonings.

This will provide a tablespoon for each of 16 people.

### WHITE SAUCE

2 tablespoons butter.	½ teaspoon salt.
2 tablespoons flour.	¼ teaspoon pepper.]
1 cup milk.	



Melt the butter, stir in the flour, and cook until smooth, but not brown; add the milk slowly and cook until smooth and creamy. Season.

This makes 12 portions of 1 tablespoon each.

Of numerous salad dressings, the following are well suited to school-lunch use. As they are used chiefly for moistening sandwich fillings, it is difficult to give the number of people they will serve.

### OIL AND VINEGAR DRESSING

$\frac{1}{2}$ teaspoon salt.	6 tablespoons oil (olive, cotton-
2 tablespoons vinegar.	seed, peanut, or other).
Few grains Cayenne.	

Mix the ingredients and beat them until they are well blended.

### COOKED SALAD DRESSING

2 egg yolks.	1 teaspoon salt.
$\frac{3}{4}$ cup milk.	$\frac{3}{4}$ tablespoon flour.
$\frac{1}{4}$ cup vinegar.	1 teaspoon mustard.
$2\frac{1}{2}$ tablespoons butter.	

Mix all the dry ingredients with the egg yolks; beat until light and add the melted butter, cold milk, and hot vinegar. Cook in double boiler until the mixture coats the spoon. If it curdles, place the boiler at once into a pan containing cold water and beat until smooth. One whole egg may be used in place of two yolks.

### MAYONNAISE DRESSING

1 egg yolk.	1 cup salad oil (olive, cotton-
1 teaspoon salt.	seed, peanut, or other).
$\frac{1}{2}$ teaspoon mustard.	2 tablespoons lemon juice and
$\frac{1}{4}$ teaspoon Cayenne.	vinegar.
1 tablespoon sugar.	

Put the egg yolk into a cold bowl; add the seasonings and mix until smooth; then add the oil, one drop at a time, stirring constantly. As it thickens, thin with vinegar and lemon juice.

## Sweets

Several recipes for simple sweets follow:

## FRUIT AND NUT CONFECTION

- |   |                       |
|---|-----------------------|
| 1 pound figs.                             | 1 pound nut meats.    |
| 1 pound dried prunes or seedless raisins. | Confectioners' sugar. |

Wash, pick over, and stem the fruits and put them with the nut meats through a meat chopper, and mix thoroughly. Roll out to a thickness of about  $\frac{1}{2}$  inch on a board dredged with confectioners' sugar, and cut into small pieces. If this candy is to be kept for some time, the pieces should be separated by means of paraffin paper.

Provides 24 2-ounce portions.

## CANDIED FRUIT PEEL

The candied peel of oranges, grape fruit, kumquats, and other citrus fruits make a good sweet which is economical, because it utilizes materials which might otherwise be thrown away. Its preparation makes an interesting school exercise. The skins can be kept in good condition for a long time in salt water, which makes it possible to wait until a large supply is on hand before candying them. The salt water takes out some of the bitter taste. The skins should be washed in clear water after removal from the salt water, boiled until tender, cut into small pieces, and then boiled in a thick sugar sirup until they are transparent. They should then be lifted from the sirup and allowed to cool in such a way that superfluous sirup will run off. Finally they should be rolled in pulverized or fine granulated sugar.

## HONEY CAKES

Simple honey cakes, such as those for which recipes are given in one of our earlier publications,<sup>1</sup> are convenient for use in school lunches, for, because of their unusual keeping qualities, a large supply can be made up at one time. Honey drop cakes and hard honey cake are especially suitable.

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 653 (1915), pp. 17, 20.

## BOILED CUSTARD

2 cups hot milk.

Speck of salt.

3 egg yolks.

Flavoring.

 $\frac{1}{4}$  cup sugar.

Beat the yolks slightly and add the sugar and salt. Pour the hot milk over this mixture, stirring constantly. Cook in a double boiler, stirring until the mixture thickens and will form a coating on the spoon. Cool and flavor. If the custard curdles, beat with an egg beater.

If the whites of eggs are to be used, beat them very stiff and add 3 tablespoons of powdered sugar. Place by spoonfuls on water which is hot but not boiling. Cover the dish. Test occasionally by putting a knife into it; when it is done nothing will stick to the knife. Remove from the water with a wire egg beater or split spoon and place on top of the custard.

## Summary

The problem of planning, preparing, and serving the midday meal for the child in school will vary with the region, the location and equipment of the school, and many other factors. No general discussion can give detailed advice suited to all different conditions.

In the foregoing pages matters of fundamental interest are considered. The child's dietetic needs are outlined. Food combinations are suggested, which will be of use in schoolroom menu making, and directions are given for making a number of dishes which may be taken as examples of those which can be prepared at school. Such dishes should be supplemented by bread, butter, fruit or vegetables, and sweets, which can be brought from home or prepared at the school, if this is more convenient. Reasons are given for the recommendations that the lunch at school receive thought and attention at all times and that, wherever children are unable to go home at noon, the school lunch form a definite part of the educational program.



# U. S. DEPARTMENT OF AGRICULTURE FARMERS' BULLETIN NO. 771

---

## HOMEMADE FIRELESS COOKERS AND THEIR USE<sup>1</sup>

Prepared in the Office of Home Economics

---

*Contribution from the States Relations Service*  
A. C. TRUE, Director

---

### INTRODUCTION

The principle employed in the fireless cooker has long been known and may be briefly stated as follows: If a hot body is protected by a suitable covering, the heat in it will be retained for a long time instead of being dissipated by radiation or conduction. In using a fireless cooker, the food is first heated on the stove until the cooking has begun and then it is placed in the fireless cooker, a tight receptacle in which the food is completely surrounded by some insulating substance, which prevents the rapid escape of the heat so that it is

<sup>1</sup> Prepared under the direction of C. F. Langworthy, Chief, Office of Home Economics.

NOTE.—This bulletin, which represents the results of experience and experiment, is especially adapted to the use of housekeepers who wish simple directions for making and using fireless cookers.

retained in the food in sufficient quantity to complete the cooking. Sometimes an additional source of heat, such as a hot soapstone or brick, is put into the cooker with the food, when a higher cooking temperature is desired. The same principle is also employed in other ways in cookery. For example, in camps, beans are often baked by burying the pots overnight with hot stones and ashes, the whole being covered with earth, and in the "clam bakes" on the Atlantic coast, the damp seaweed spread over the embers and the clams prevents the escape of the heat during cooking. The peasants in some parts of Europe are said to start their dinner cooking and then put it into hay boxes or between feather beds so that the cooking may be completed while the family is absent in the fields.

One of the chief advantages of the fireless cooker is that it accomplishes a saving in fuel, especially where gas, kerosene, or electric stoves are used. Where coal or wood is the fuel, the fire in the range is often kept up most of the day and the saving of fuel is less. In summer or when the kitchen fire is not needed for heating purposes, the dinner can be started on the stove early in the morning and then placed in the fireless cooker, the fire in the range being allowed to go out. During hot weather the use of a kerosene or other liquid-fuel stove and a fireless cooker is a great convenience, since it not only accomplishes a saving in fuel but helps to keep the kitchen cooler. As would be expected, the saving in fuel resulting from the use of a fireless cooker is greatest in the preparation of foods like stews, which require long and slow cooking.

The great convenience of the fireless cooker is that it saves time, for foods cooked in it do not require watching and may be left to themselves while the cook

is occupied with other duties, or the family is away from home, without danger from fires or overcooking the food. Its use, therefore, may enable a family to have home cooking instead of boarding, or hot meals instead of cold foods. Another advantage of the use of the fireless cooker is that it makes it easier to utilize cheaper cuts of meat, which, although not having as fine a texture or flavor, are fully as nutritious, pound for pound, as the more expensive cuts. Long cooking at relatively low temperature, such as is given foods in the fireless cooker, improves the texture and flavor of these tougher cuts of meat.

### How to Make a Homemade Fireless Cooker

While there are many good fireless cookers on the market, it is possible to construct a homemade cooker which, if properly built, will give very satisfactory results and will be cheaper than one which is purchased. The materials needed are a box or some other outside container, some good insulating or packing material, a kettle for holding the food, a container of the kettle or a lining for the nest in which the kettle is to be placed, and a cushion or pad of insulating material to cover the top of the kettle.

For the outside container a tightly built wooden box, such as can be readily constructed, is the most satisfactory. An old trunk, a small barrel, or a large butter or lard firkin or tin may be used. Another possibility is a galvanized-iron bucket with a closely fitting cover; this latter has the advantage of being fireproof. A shoe box, 15 by 15 by 28 inches, is convenient in size, since it may be divided into two compartments. The box should have a hinged cover, and at the front side a hook and staple or some other



device to hold the cover down; an ordinary clamp window fastener answers the latter purpose very well. Whatever the container used, its size, which depends upon the size of the kettle used, should be large enough to allow for at least 4 inches of packing material all around the nest in which the kettle is placed.

The kettles used for cooking should be durable and free from seams or crevices, which are hard to clean. They should have perpendicular sides and the covers should be as flat as possible, and provided with a deep rim shutting well down into the kettle to retain the steam. It is possible to buy kettles made especially for use in the fireless cookers; these are provided with covers which can be clamped on tightly. The size of the kettle should be determined by the quantity of food to be cooked. Small amounts of food can not be cooked satisfactorily in large kettles, and it is therefore an advantage to have a cooker with compartments of two or more different sizes. Kettles holding about 6 quarts are of convenient size for general use. Tinned iron kettles should not be used in a fireless cooker, for, although cheap, they are very apt to rust from the confined moisture. Enameled ware kettles are satisfactory, especially if the covers are of the same material. Aluminum vessels may be purchased in shapes which make them especially well adapted for use in fireless cookers and, like enameled ware, they do not rust.

Fireless cookers are adapted to a much wider range of cooking if they are provided with an extra source of heat, since a higher cooking temperature may thus be obtained than if hot water is depended upon as the sole source of heat. Obviously this introduces a possible danger from fire in case the hot stone or other substance

should come into direct contact with inflammable packing material like excelsior or paper. To avoid this danger a metal lining must be provided for the nest in which the cooking vessel and stone are to be put. As an extra source of heat a piece of soapstone, brick, or an iron plate, such as a stove lid, may be used. This is heated and placed in the nest under the cooking vessel; sometimes an additional stone is put over the cooking vessel.

The container for the cooking vessel, or the lining for the nest in which it is to be put, should be cylindrical in shape; should be deep enough to hold the cooking kettle and stone, if one is used; and should fit as snugly as possible to the cooking vessel, but at the same time should allow the latter to be moved in and out freely. If the cylinder is too large, the air space between it and the kettle will tend to cool the food. For this purpose a galvanized iron or other metal bucket may be used or, better still, a tinsmith can make a lining of galvanized iron or zinc, which can be provided with a rim to cover the packing material. In case no hot stone or plate is to be used in the cooker, the lining can be made of strong cardboard.

For the packing and insulating material a variety of substances may be used. Asbestos and mineral wool are undoubtedly the best, and have the additional advantage that they do not burn. Ground cork (such as is used in packing Malaga grapes), hay, excelsior, Spanish moss, wool, and crumpled paper may also be used satisfactorily. Of the inexpensive materials that can be obtained easily, crumpled paper is probably the most satisfactory, since it is clean and odorless and, if properly packed, will hold the heat better than some of the others. To pack the container

with paper, crush single sheets of newspaper between the hands. Pack a layer at least 4 inches deep over the bottom of the outside container, tramping it in or pounding it in with a heavy stick of wood. Stand the container for the cooking vessel, or the lining for the nest, in the center of this layer, and pack more crushed papers about it as solidly as possible.

If other packing, such as excelsior, hay, or cork dust, is used, it should be packed in a similar way. Where an extra source of heat is to be used, it is much safer to pack the fireless cooker with some noninflammable material, such as asbestos or mineral wool. A cheap and easily obtained substitute are the small cinders sifted from coal ashes, preferably those from soft coal, which may be obtained at the boiler house of any mill. The cinders from hard coal burned in the kitchen range will do, however. Experiments with this material made in this office showed that it is very nearly as satisfactory as crumpled paper as a packing material. If a fireproof packing material is not used a heavy pad of asbestos paper should be put at the bottom of the metal nest and a sheet or two of asbestos paper should be placed between the lining of the nest and the packing material. Whatever packing material is used should come to the top of the container for the kettle, and the box should lack about 4 inches of being full. A cushion or pad must be provided to fill completely the space between the top of the packing and the cover of the box after the hot kettles are put in place. This should be made of some heavy goods, such as denim, and stuffed with cotton, crumpled paper, or excelsior. Hay may be used, but will be found more or less odorous.



### How to Use the Fireless Cooker

Obviously the fireless cooker must be used with intelligence to obtain the best results. It is best suited to those foods which require boiling, steaming, or long, slow cooking in a moist heat. Foods can not be fried in it, pies can not be baked successfully in the ordinary fireless cooker, nor can any cooking be done which requires a high, dry heat for browning. Meats, however, may be partially roasted in the oven and finished in the cooker, or may be begun in the cooker and finished in the oven with much the same results as if they were roasted in the oven entirely. The classes of food best adapted to the cooker are cereals, soups, meats, vegetables, dried fruits, steamed breads, and puddings.

When different foods are cooked together in the fireless cooker they must be such as require the same amount of cooking, since the cooker can not be opened to take out food without allowing the escape of a large amount of heat and making it necessary to reheat the contents. It would not do to put foods which need about  $1\frac{1}{2}$  hours to cook, into the cooker with a piece of meat which should stay several hours.

The size of the container used in cooking with the fireless cooker should be governed by the amount of food to be cooked. Small quantities of food can not be cooked satisfactorily in a large kettle in the fireless cooker. If a large kettle must be used, better results will be obtained if some other material which holds heat fairly well is used to fill up the empty space. This may be accomplished in several ways. One is to put the small quantity of food to be cooked into a smaller, tightly closed kettle, fill the large kettle

with boiling water and put the small kettle into it, standing it on an inverted bowl or some other suitable support. This boiling water will take up and hold the heat better than air would. Several smaller dishes (if tightly covered) may be placed in the kettle surrounded by boiling water. Baking powder or other tins often are found useful for this purpose. Another way is to place one food in a basin which just fits into the top of a large kettle, and to let some other material, some vegetable perhaps, cook in the water in the bottom of the kettle. Two or more flat, shallow kettles placed one on top of the other so as to fill the cooker enable one to cook small amounts of different foods successfully. Such kettles, made especially for use in fireless cookers, may be purchased.

The length of time each kind of food should stay in the cooker depends both on the nature of the food and on the temperature at which it remains inside the cooker; and before recipes for use with the fireless cooker, can be prepared, one must have some means of knowing how temperatures are preserved in it. In experiments made in this office a 6-quart kettle was filled with boiling water and put into the cooker, the packing of which happened to be newspaper. The temperature of the water, which was 212° F. when put into the cooker, was found to be 172° F. after 4 hours had elapsed and 155° F. after 8 hours had elapsed. This shows the advisability of the common custom of allowing food to remain undisturbed in the cooker for at least 6 or 8 hours, or in some cases overnight. If a soapstone, hot brick, or extra source of heat is used, less time will be required. Materials which are denser than water (sugar sirup as used in cooking dried fruit), and therefore can be heated to a higher degree, will keep up the

temperature longer when put into the cooker. Thus the density of the food material, as well as the amount and the length of time that the apparatus retains the heat, must be taken into consideration in determining how long different materials must be cooked in the cooker.

The recipes for dishes to be prepared in the fireless cooker differ somewhat from those for foods cooked in the ordinary way, chiefly in the amount of water or other liquids called for. Less liquid should be put into the food to be prepared in an ordinary fireless cooker, since there is no chance for water to evaporate. The cook must be guided largely by experience in deciding how long the food should be heated before being put into the cooker and how long it should be allowed to remain there. Fortunately there are several good fireless cook books on the market whose directions can be relied upon, and at the end of this publication several selected recipes are given.

### Recipes for Use with the Fireless Cooker

The following recipes, prepared by Miss Ola Powell and Miss Mary E. Creswell, have been used in extension work in the Southern States:

#### CREOLE CHICKEN

- |   |  |
|---|--|
| 1 medium-sized chicken.   | $\frac{1}{4}$ pound ham or 2 or 3 slices |
| 6 tomatoes or 1 No. 2 can tomatoes.                                   | bacon chopped finely.                    |
| 3 sweet red peppers cut into small cubes.                             | 1 bay leaf.                              |
| 3 sweet green peppers cut into small cubes or 1 No. 2 can of peppers. | 1 tablespoon chopped parsley.            |
|   | 2 teaspoons salt.                        |
|   | 1 onion (size of egg).                   |
|   | 2 tablespoons butter or bacon drippings. |



Cut chicken as for stew; sear by dropping it into 1 pint boiling water, then let simmer gently for  $\frac{1}{2}$  hour.

Cook the chopped onion in the butter or meat drippings until light yellow. Simmer tomatoes for 15 minutes with the bay leaf, strain, and pour over the onions. Now add the minced ham and parsley and cook for 15 minutes longer. To this mixture add the chopped peppers and the chicken stock and bring to a boil. Put the chicken into the fireless-cooker vessel, pour over it this mixture of vegetables and let boil 5 minutes. Put at once into the fireless cooker. With the hot soapstone, let the chicken stay in the cooker for 2 hours; without hot stone, for 3 hours.

A ham bone may be substituted for the ham or bacon. If this is done, boil it for  $\frac{1}{2}$  hour in enough water to cover. Then add 1 cup of the ham broth to the tomato before cooking it with the bay leaf. This recipe gives a good way to use chicken too old to fry or broil. A similar dish can be made by using a quart of canning club soup mixture. When necessary, thicken the broth with a little browned flour before putting the chicken into the cooker.

### Cereals

*Hominy grits.* Five cups water, 2 teaspoons salt, 1 cup hominy grits. Pick over and wash hominy grits. Have the salted water boiling and add the hominy slowly, so as not to stop the boiling. Continue to boil rapidly for 10 minutes over the fire, then put the vessel into the cooker as quickly as possible and allow to remain (overnight) for about 12 hours. The vessel of hominy may be placed in another vessel of boiling water before being placed in the cooker.

*Samp (coarse hominy).* One-half cup samp soaked in 1 cup cold water 6 hours. Add  $1\frac{1}{2}$  teaspoons salt and 3 cups boiling water. Boil rapidly 45 minutes. Put into cooker for 8 to 12 hours.

*Oatmeal.* Three cups water, 1 teaspoon salt, 1 cup oatmeal. Carefully look over the oatmeal and remove any husks or foreign substance. Add gradually to the boiling salted water and boil rapidly for 10 minutes, stirring constantly. Now it may be put into the cooker. After 2 or 3 hours it is soft, but a better flavor will be developed by longer cooking. It may remain in the cooker overnight, just as the hominy grits are cooked (about 12

hours). Next morning it may have to be reheated. To do this, set the cooker pan in a pan of water over the fire. When the water boils up well, the oatmeal may be served.

*Plain rice.* One cup rice, 3 cups water,  $1\frac{1}{2}$  teaspoons salt. Look over and wash the rice through several waters, until cloudiness is removed. Bring the salted water to a boil. One-half teaspoon lard may be added. Then add rice gradually to the boiling water in the cooker vessel so as not to stop the boiling. The grains should be kept moving in the boiling water. Allow to boil 5 minutes before putting it into the cooker for 45 minutes or an hour.

There is considerable difference in rice. Old rice absorbs more water than new rice, and the time for cooking it will vary. An hour will be sufficient usually for this small amount. Rice is injured by overcooking. When rice is tender, drain in colander and place in warm oven for about 5 minutes. Serve at once. Sometimes it is well, after draining rice in colander, to pour cold water over it. This will wash away the starchy substance between the grains, and keep them from adhering or sticking together. Then place the colander in a hot oven, to heat and dry out the rice. If desired the lard may be omitted. It lends a brilliancy to the rice grains when cooked.

*Rice in pilaf* (an oriental mixture). Two cups stock, 1 cup rice, 2 tablespoons butter, 1 teaspoon sugar, 2 slices onion, 6 ripe tomatoes or 1 cup canned tomato juice, 1 teaspoon salt,  $\frac{1}{8}$  teaspoon pepper, 1 tablespoon chopped green sweet pepper may be added.

Look over and wash the rice. Chop the onion very finely and fry in 1 tablespoon of the butter until yellow. Add to it the boiling juice of the tomatoes and the boiling broth, and allow all to boil before adding the rice gradually so as not to stop the boiling. Boil mixture about 5 minutes and place in cooker 1 hour. When ready to serve, add 1 tablespoon butter. Stir with a fork to mix evenly. Pilaf is injured by overcooking.

### Soups

*Vegetable soup* (made without stock). One-half cup carrots,  $\frac{1}{2}$  cup turnips, 1 cup potatoes,  $\frac{1}{2}$  cup onions,  $\frac{1}{2}$  cup cabbage, 3 cups tomato juice or 1 No. 3 can tomatoes, 1 tablespoon flour, 2 teaspoons salt, 1 tablespoon celery seed (crushed), 1 quart water, 4 tablespoons butter,  $\frac{1}{2}$  tablespoon parsley,  $\frac{1}{4}$  teaspoon pepper.

Cut all vegetables (except potatoes and onions and parsley) into small pieces. Cook them for 10 minutes in 3 tablespoons butter. Add potatoes and cook 3 minutes longer. Mix all ingredients (except parsley) in the cooker utensil and boil 5 minutes. Mix 1 tablespoon butter and 1 tablespoon flour; add enough of the liquor to make it smooth and pour it into the mixture. Cook 5 minutes more and put into the cooker for 4 to 6 hours.

*Creole soup* (made with stock). Stock: Two pounds shin beef (meat and bone),  $1\frac{1}{2}$  quarts water. Cut the meat from the bone into small pieces. Crack the bone and soak 1 hour in cold water. Bring to a boil slowly, and when boiling place in the cooker for 5 to 7 hours. When cooked, strain and set away to cool. The cake of fat which forms on top when stock is cold seals the stock and keeps out air and germs and should not be removed until soup is to be made. Then fat is removed and stock heated and any seasonings or additions desired are put in.

To 1 quart of this stock or 1 quart water in which chicken has been cooked, add 1 quart of canned soup mixture and 2 tablespoons rice or barley, bring to a boil and cook in cooker 2 to 3 hours. This will make a delightful soup.

*Meat and vegetable combinations.* With the less tender cuts of beef and mutton which require long, slow cooking, delicious dishes may be prepared by adding vegetables and cooking in the fireless cooker.

Cut the meat into cubes, dredge with flour, and brown it in meat drippings or lard and butter. Then brown the onions in the same fat. For every 3 or 4 cups of meat use one of the following vegetable combinations or 1 quart of canning club soup mixture. Put into the fireless cooker vessel and add 1 cup boiling water with the first combination, or 2 cups water with the second one. Boil for 5 minutes and put into cooker for 3 or 4 hours.

#### FIRST

2 cups okra.  
2 cups tomatoes.  
2 onions.  
 $1\frac{1}{2}$  teaspoons salt.  
 $\frac{1}{8}$  teaspoon pepper.

#### SECOND

2 cups potatoes.  
1 cup turnips.  
1 cup carrots.  
2 onions.  
 $\frac{1}{2}$  cup celery or 1 tablespoon celery seed, crushed.



The following recipes, prepared by Mrs. K. C. Davis and Miss Angeline Wood, have been used in demonstrations in connection with the extension work in the Northern and Western States:

### Cereal Breakfast Foods

Cereal breakfast foods should be prepared at night while the fire for supper is hot. Measure the required quantity of boiling water into the cooker kettle; add salt and cereal; let boil 10 minutes and place in box overnight. Reheating in the morning will probably be necessary. In winter enough for two or three breakfasts may be cooked at once and reheated as wanted. The food in the inner kettle should be cooked about 5 minutes before placing in the outer kettle. Then the whole should stand over the flame until the water boils in the outer kettle. Any other kind of breakfast cereal may be cooked by adopting these general directions.

The raw cereal breakfast foods, such as plain oatmeal, hominy, cracked wheat, etc., cost less than those which are partly cooked by steam at the factory, but frequently housekeepers prefer not to use them because they require so many hours of cooking. A cooking box, however, is especially well adapted for cooking just this sort of material. Even the cereal preparations which are partly cooked at the factory and are supposed to need only a few minutes cooking to make them ready for the table are much improved by long, slow cooking such as they get in the cooking box. The flavor and texture of cereal breakfast foods are influenced by the length of time they are cooked, and with the cooking box it is easily possible to secure the texture and flavor dependent upon long, slow cooking.

### Soups

The cheap cuts of meat are rich in the food materials that make palatable dishes, and the bones and scraps are good for making wholesome soup. If care is taken to use material which might otherwise be wasted, the real expense for most meat soups is in the long cooking required. The long-continued, slow cooking which a tough piece of meat obtains in the cooking box, and the thorough extraction to which bones and soup meat are subjected,

mean that the cooking box makes stews, ragouts, and similar dishes and soups cheap foods for the table. American families do not, as a rule, use as much soup as do foreigners, and thus they miss a useful and pleasant addition to the daily bill of fare, and one which may be served without much extra work or expense, if rightly prepared.

For making soup stock or broth with the cooking box, the soup bones should be well split up, or the soup meat should be cut into small pieces. Wash the meat, place it in the kettle, and cover with cold water. Bring to a boil on the stove and boil 15 minutes. Do this at night if the soup is to be used at noon the next day. Place in the cooker overnight. In the morning remove meat and bones from soup. Strain and remove fat. Return soup and meat to kettle, adding whatever seasoning is desired. Bring to a boiling point again and return it to the box and let remain until noon. This stock may be used as a foundation for several soups, such as vegetable soup, clear soup, or noodle soup.

Beef soup may be varied almost infinitely by the different seasonings which may be added. There is scarcely a vegetable grown which is not good in beef soup. In winter many of the dried vegetables, such as beans, peas, lentils, etc., are excellent for this purpose.

Dried Lima beans, peas, and lentils make excellent soup without meat. Since they require long-continued cooking, they are well adapted to fireless-cooker methods. These dried vegetables, cooked with less water and no meat, rubbed through a coarse sieve and made into the proper consistency with milk or thin cream, and seasoned to taste, make so-called "cream" soups. Soups made by thinning the cooked legumes with water, and seasoning with onion (fried until pale brown), with celery tops, and other vegetables are very palatable also.

### Meats

Some cuts of meat which are not so readily prepared for the table by the usual methods are especially palatable if cooked in the cooking box. The experimenter will soon learn that in cooking meats, the amount of boiling over the flame and the time in the box will depend upon the size of the pieces of meat being cooked. Meat cut into pieces for stew will heat through

more readily and cook in a shorter time than will a large ham, for example. Most recipes for stews, pot roasts, boiled meats, and similar dishes can be readily adapted to the fireless cooker, and save time and fuel. The following recipes are all well adapted to the cooking box, as all of them are dishes which require considerable time for their preparation by the usual methods.

*Pot roast.* Use any preferred cut. Sear in hot fat in a skillet. Place the meat in the cooker kettle, and cover with boiling water. Boil gently for 30 minutes (20 minutes will suffice if the roast is 3 pounds or less). Place in the cooker overnight. Reheat in the morning, season, and return to the cooking box until noon. Thicken some of the liquor for gravy. If it is desired to slice cold for next dinner, return meat to liquor and let stand until wanted.

*Brown fricassee of chicken.* Joint the chicken and brown in fat after rolling in flour. As pieces brown, pack them in the kettle. When all are browned make gravy in the skillet where the browning was done. Add this to the chicken, with enough boiling water to cover. Salt and pepper. Boil 20 minutes. Place in box over night. Reheat and return to box until noon. This length of time in the box will reduce the toughest old fowl on the farm to a state where the meat will fall from the bones.

*Roast meat.* Prepare a 4-pound rib roast as for oven roasting. It can be tied more compactly if the ribs are removed. Place in pan in very hot oven for  $\frac{1}{2}$  hour, or sear the roast until brown in a frying pan and then place it in the oven for 20 minutes. Have ready a small pail into which the roast will fit as closely as possible. Place the seared and heated roast in this and set it into the large kettle used in the box, with enough boiling water to come well up around the small pail. Place in the box for 3 hours.

*Roasting tough poultry.* Many housewives make a practice of stewing chicken or turkey which they think is likely to be tough, and the practice is a good one. It is, however, much easier to boil for 15 or 20 minutes and then put the fowl, boiling hot, into the cooker and let it remain 10 hours. It should then be drained, wiped dry, and stuffed, if stuffing is desired, and roasted long enough to brown it well.

*Boiled dinner.* Cook a piece of corned beef and a piece of salt pork in the cooker overnight. In the morning prepare all



the vegetables it is desired to use, and place in the kettle with meat. The greater the variety the better the dinner. Boil 10 or 15 minutes and return to the cooker. It is best to leave potatoes until an hour and a quarter before serving, as they are the only vegetables likely to suffer from too long a time in the cooker. When they are added bring the contents of the kettle to the boiling point again. The liquid from the boiled dinner makes a good soup if the corned beef and salt pork have been parboiled to remove some of the salt.

### Fresh Vegetables

Carrots, peas, string beans, onions, beets, turnips, parsnips, salsify, and in fact all vegetables may be cooked in the cooking box. They must be given time according to their age. A safe rule for all green vegetables is  $2\frac{1}{2}$  times as long in the cooker as if boiled on the stove. This method is particularly good for such vegetables as onions, cabbage, and cauliflower, as there is no escape of odor from the cooker. A further advantage with cabbage, cauliflower, and other green vegetables is that overcooking is avoided. When green vegetables are cooked too long in boiling water they turn yellow and lose their fine flavor. This they do not do so readily at the same temperature of the cooking box.

*Boston beans and other dried vegetables.* In cooking dry beans, the time required either in the oven or the cooking box will vary with the length of time the beans have been kept; the older the beans, the more cooking required. Soak 1 quart of beans overnight; in the morning drain them and cover with cold water and heat to boiling. Let boil until the skins will burst when touched very lightly, adding  $\frac{1}{4}$  teaspoon of soda a few minutes before taking from the fire. Drain through a colander. Return to the kettle and add 1 teaspoon of salt, 1 teaspoon of mustard, 3 tablespoons molasses, and  $\frac{1}{2}$  pound of salt pork, washed and scraped, and cover with boiling water. Let boil 20 or 30 minutes, then place in the cooking box. If the beans are new, 6 hours in the box will be long enough. Old beans require longer cooking and should be left in the box overnight, then reheated in the morning, and returned to the box. They will be ready to serve for the midday meal.

Dried vegetables, such as peas, beans, Lima beans, lentils, or

corn may be soaked in cold water several hours, and then after the preliminary boiling of a few minutes kept from 6 to 12 hours in the cooker. They may be cooked with salt pork, and thus prepared they are liked by many, or they may be cooked with vegetable oil, as olive oil, or they may be cooked plain and seasoned with salt, pepper, and butter or cream. The longer, then, dry vegetables are cooked in the box, the more palatable and the more digestible they will be.

### Dried Fruits

In the case of dried fruits as well as dried vegetables, long continued, slow cooking is desirable. A common method is as follows: Wash the fruit well and let it soak in cold water until it has regained its natural size, and then place on the back of the range and allow it to remain there for 20 hours, but do not allow it to boil. When fruit is cooked in the cooking box, it should be washed and soaked in the way described, heated in the water in which it has been soaked, not quite to the boiling point, and then placed in the cooker for 5 or 6 hours. Because less water evaporates than when cooking on the stove, a smaller proportion of water will be needed for good results. If too much is used the sirup will not be quite so rich as usual. Fruit should always be cooked in an enamel-ware or an earthenware dish, as tin or iron may impart an unpleasant flavor to acid fruit, and also give it an undesirable color.

### Puddings and Steamed Breads

Steamed or boiled puddings, or such as require long, slow cooking, and steamed bread, like Boston brown bread, are the kinds best adapted to the cooking box. Every family has its favorite recipes and these may be used, as the method of procedure is the same for cooking all such foods.

The steamed or boiled puddings or breads should be placed in molds well buttered. For this purpose pound baking-powder cans are excellent. Coffee cans or other tin boxes of suitable size with covers will do. After filling about two-thirds full to allow for the expansion or rising of the batter or dough, the cans are placed in the cooker kettle and should have the covers put on before the boiling begins. If any covers are missing, paper may be tied tightly over the tops. If there are not enough cans

to fill the kettle so that they will not tip over when the boiling water is poured around them, an empty can or two may be wedged in, to hold the others in place. Fill the kettle as full as possible with boiling water, as the more water, the longer the heat will be retained. Place the kettle on the stove and boil for a full  $\frac{1}{2}$  hour, and then keep the kettle and contents in the cooking box 3 to 6 hours, or longer if the cans are large ones. This applies particularly to breads or puddings made with wheat flour. If they contain corn meal or graham flour they should be cooked for a longer time in the cooker.

On removing from the cooker, it is a good plan to set the loaves of bread in a hot oven for 10 minutes to dry them a little.

### NOTE

The government bulletins from which the material contained in this book was culled, as well as other bulletins to be issued in the future by the United States Department of Agriculture, may be obtained on application to the Department of Agriculture, Washington, D. C. The readers of this book are heartily urged to avail themselves of this privilege, especially as regards future bulletins; for from now until the conclusion of the war, and, indeed, for an indefinite period thereafter, it will be the patriotic duty of every American housewife to follow, in so far as she is able, the directions thus issued. That this patriotic service will carry with it a rich reward, must be at once apparent to every housewife grappling with the problem of providing her family with nourishing food at minimum cost; for it is to aid her in this important task that these bulletins, prepared for the government by the foremost experts in the land, are being published.



## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly aged or off-white appearance.

## This image shows a single page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



## This image shows a single sheet of cream-colored paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

# MEMORANDUM

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

# MEMORANDUM

This image shows a single page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



## This image shows a single page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be from a notebook or a set of legal pads. The edges of the paper are slightly irregular, suggesting it might be a scan of a physical document. There is no handwriting or other markings on the page.

## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly aged or off-white appearance.

[illegible]

# MEMORANDUM

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



## This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

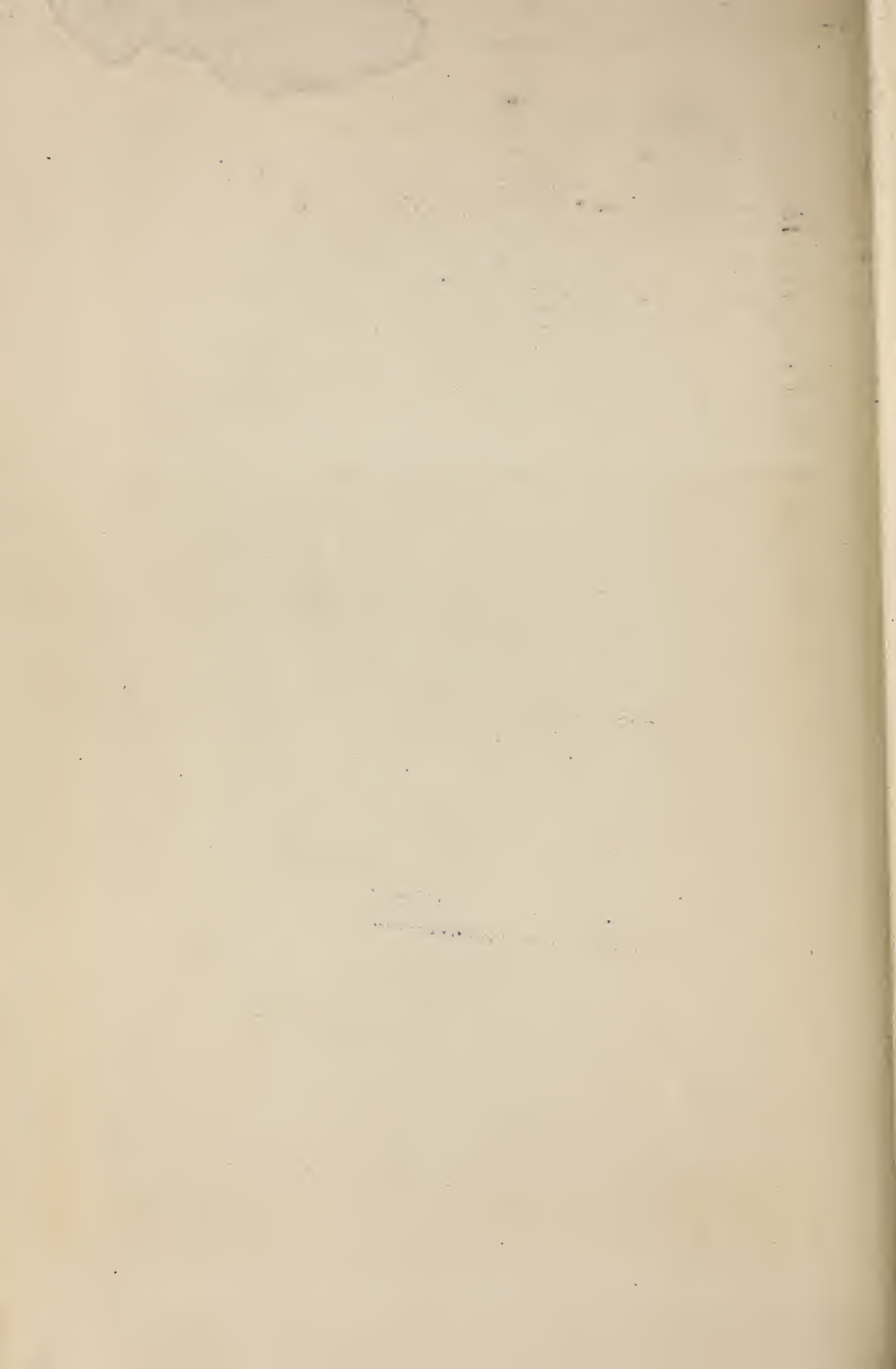
[illegible]



# MEMORANDUM

[illegible]









LIBRARY  
U.S.D.A.

BUREAU OF  
HOME ECONOMICS

